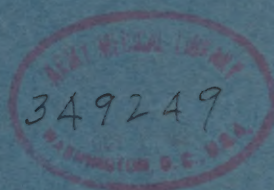


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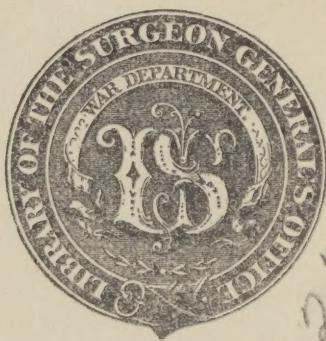


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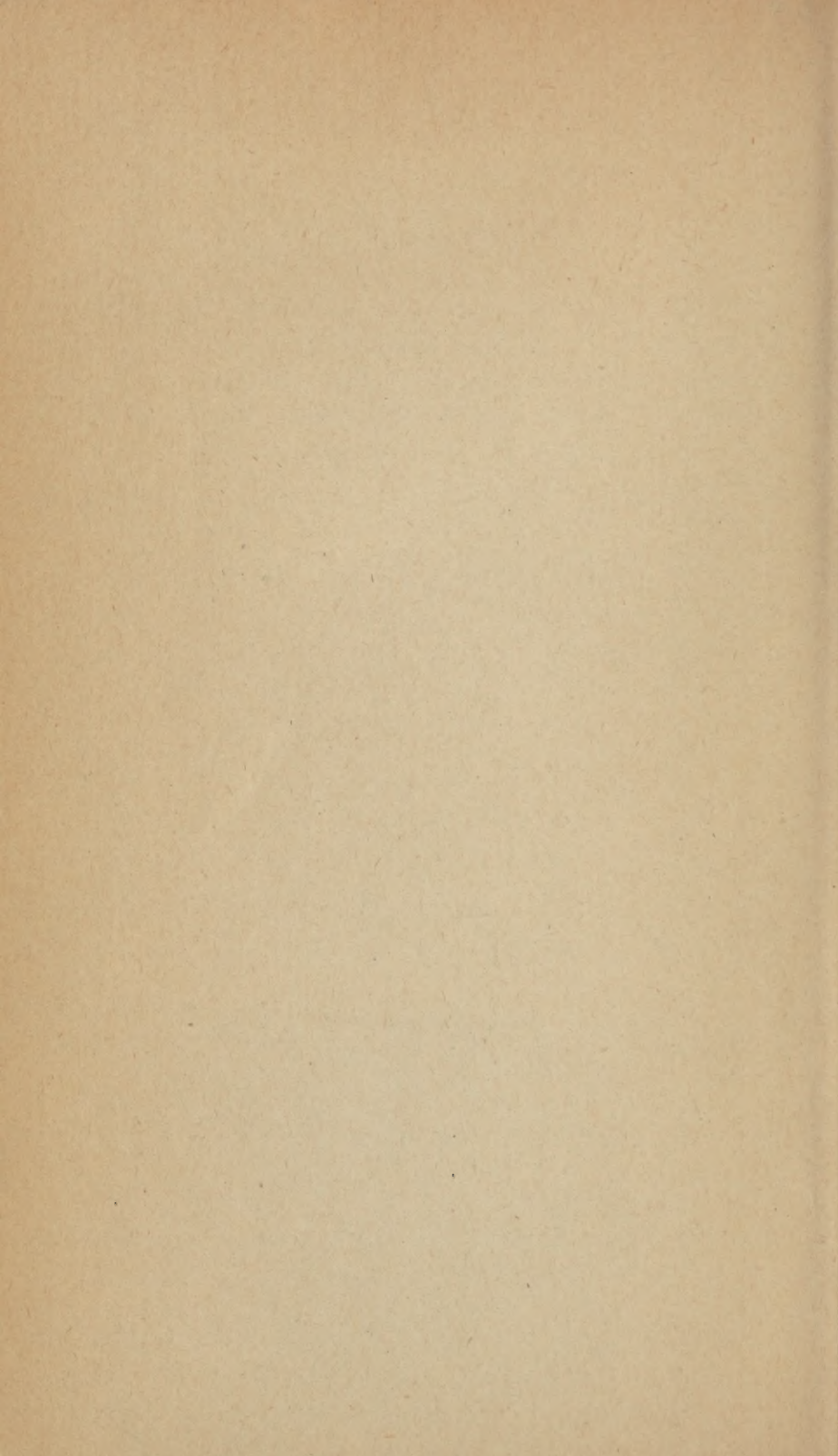
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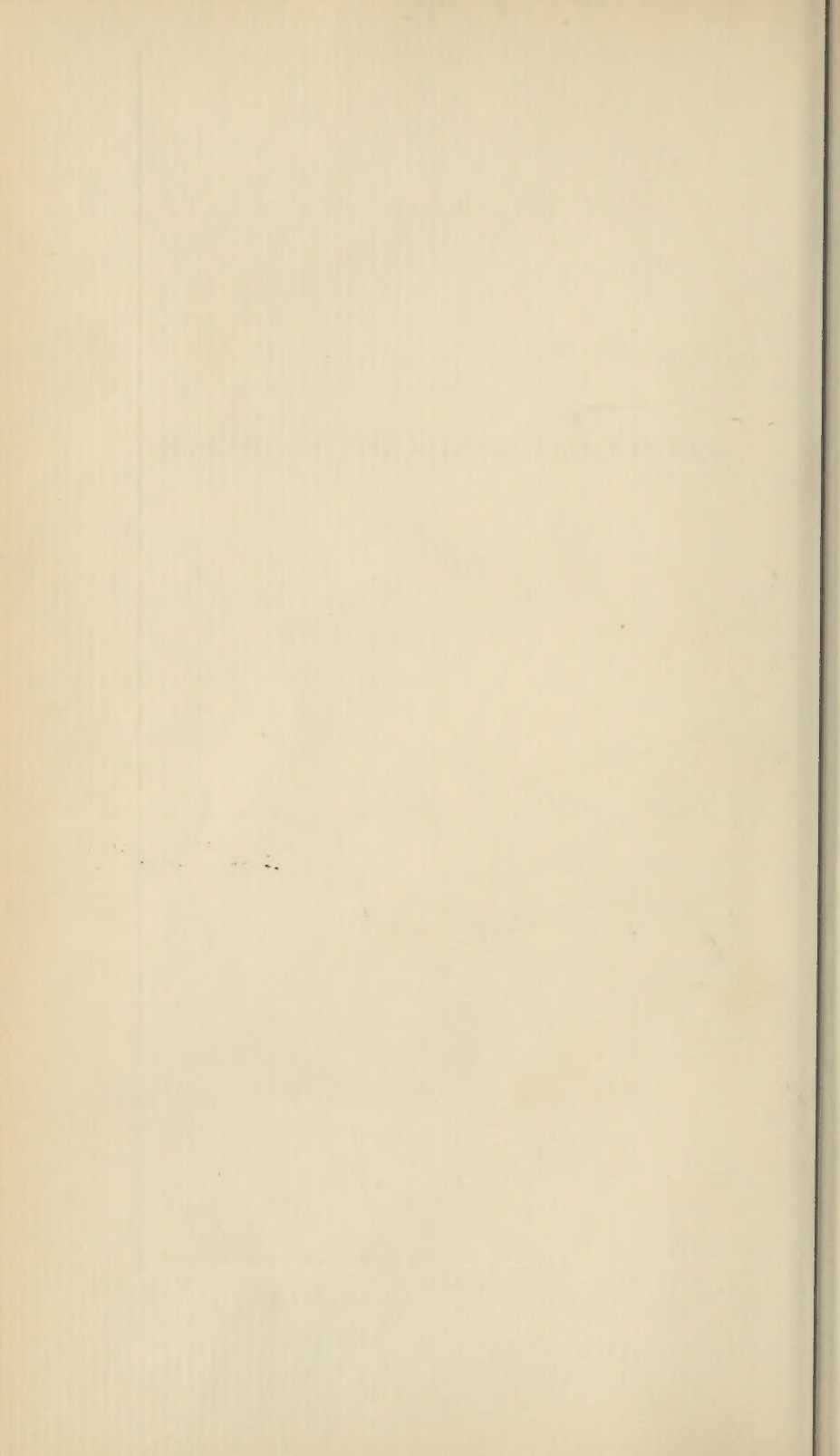
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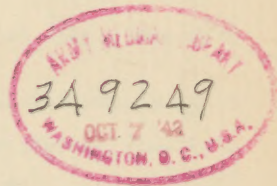
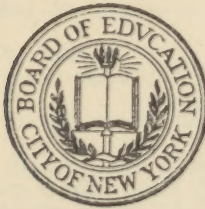
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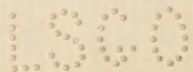
THE COMMITTEE FOR THE STUDY OF THE
CARE AND EDUCATION
of
PHYSICALLY HANDICAPPED CHILDREN
in the
PUBLIC SCHOOLS OF THE CITY OF NEW YORK

REPORT OF THE SUB-COMMITTEE ON
ACOUSTICALLY HANDICAPPED
CHILDREN



THE BOARD OF EDUCATION
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in the
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REPORTS
of
THE COMMITTEE FOR THE STUDY OF THE
CARE AND EDUCATION OF PHYSICALLY
HANDICAPPED CHILDREN

GENERAL REPORT

PHYSICALLY HANDICAPPED CHILDREN IN NEW YORK CITY

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CHILDREN WITH SPEECH DEFECTS	WALTER O. KLINGMAN, M.D. <i>Chairman</i>
CHILDREN WITH TUBERCULOSIS	I. OGDEN WOODRUFF, M.D. <i>Chairman</i>
EPILEPTIC CHILDREN	GEORGE H. HYSLOP, M.D. <i>Chairman</i>
OPEN AIR CLASSES AND THE CARE OF BELOW PAR CHILDREN	I. OGDEN WOODRUFF, M.D. <i>Chairman</i>
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PSYCHOLOGICAL CONSIDERATIONS IN THE EDUCATION OF THE HANDICAPPED	IRA S. WILE, M.D. <i>Chairman</i>
THE EDUCATION OF CHILDREN IN HOSPITALS AND CONVALESCENT HOMES	MARSHALL C. PEASE, M.D. <i>Chairman</i>
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CONTENTS

I. Preface	1
II. Historical Background	3
III. Types and Causes of Deafness	9
IV. Scope of the Study of the Committee and Otological Findings	29
V. The Elementary School for the Deaf	49
VI. Summary of Findings and Conclusions	87
VII. Recommendations	103

Preface

THIS STATEMENT of findings and conclusions of the committee studying the problems of acoustically handicapped children is one section of the report of the Committee for the Study of the Care and Education of Physically Handicapped Children in the Public Schools of the City of New York. The Committee was appointed by the Board of Education in 1936. All of its inquiries, which extended over a period of more than three years, have been made by sub-committees. No appropriation was given the Committee for the employment of technical and clerical personnel. The studies were possible only because of the voluntary assistance of physicians, educators and other specialists who have given much time and consideration to the problems presented by handicapped children, the provisions now made for them and the ways in which the existing program can be improved. Clerical and statistical help was provided by the Works Projects Administration and numerous philanthropic organizations.

In addition to the persons listed in this report the Committee is indebted to the Superintendent of Schools, Dr. Harold G. Campbell, to the other school officials assisting in the survey, to the committee of teachers of the Elementary School for the Deaf which submitted a self-appraisal of the current program of that school, to the Temporary State Commission to Study Facilities for the Hard of Hearing and the Deaf which made available to the Committee a part of its funds, to Dr. Rudolph Pintner and to his assistants who at the request of the Committee administered a series of psychological tests, and to Dr. Letitia Raubicheck and to the teachers of speech improvement who examined the majority of the children in the Elementary School for the Deaf.

The Director acknowledges his personal indebtedness to Dr. Lyman C. Duryea and to Dr. Robert T. Rock, Jr. Finally he is indebted to the Public Health Relations Committee of the New York Academy of Medicine which has critically reviewed this and the other reports of the Committee.

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Historical Background

THE WORD deaf or its equivalent in ancient times and in practically all languages referred to things or animals in the sense of being dull or obtuse. The same may be said of the word *dumb* or *mute*. Later these terms were applied to man bereft of speech or hearing. Since a person born deaf grew up dumb, there was a belief in earlier times that a person suffering from this double handicap was also idiotic or at least feeble-minded. In the popular mind, cause and effect were curiously reversed. We now know that the uneducated deaf child is undeveloped because he is deprived of adequate means of receiving or expressing ideas; formerly this inadequacy was regarded as the result of low mentality.

All knowledge was obtained by "word of mouth." The education of the deaf therefore was regarded as impossible years ago because they lacked the one sense through which knowledge in the beginning is mainly acquired. Dumbness was attributed to a lesion of the brain or a defect in the vocal organs. Preconceptions on this subject were handed down from generation to generation. It never occurred to anyone to study the subject in the light of experimental observation.

Increasingly as the years passed the lot of the deaf improved, particularly in regard to the attention that was given to their education. Thus, everywhere in the United States today, they are offered as a minimum an elementary school education together with the rudiments of industrial instruction. The practice is followed also at Gallaudet College and elsewhere for many who really yearn for higher education. The occupations of the deaf are varied. Among them are to be found lawyers, ministers of the gospel, teachers, numerous artisans with a sprinkling of artists, farmers, civil service employees, skilled mechanics, unskilled laborers and homemakers of high rank. Their absence from certain professions and trades is not due to lack of ability,

HISTORICAL BACKGROUND

but to difficulty of communication. They are usually good neighbors and rarely do they fail to qualify as law-abiding, self-supporting citizens. They have their state and national organizations, and usually take an interest in all public affairs.

While there were early successful sporadic attempts to educate a few favored deaf children, public sympathy was not extended to them as a group. In most cases, the teachers were philanthropists actuated by religious feeling either as priests, or ministers, or zealous laymen. Broadly speaking, religion and private philanthropy paved the way for action by the public and the government. Religious schools for the deaf still exist in various parts of the country; but, to a large extent, the government has replaced private charity in schools for the deaf.

In 1816 a group of New York philanthropists met at Tammany Hall to discuss the feasibility of establishing a school for the deaf in New York City. It was decided that the first step should be the taking of a census to ascertain if there were enough deaf children to justify a special school, the general opinion then being that one school was enough for the United States. The census showed that there were sixty-six deaf children of school age living in New York City. As a result the New York Institution for the Instruction of the Deaf and Dumb (New York School for the Deaf) was opened on May 20, 1818, as "a free school for the deaf children of the state over the age of five years." This school, located in New York City, was founded only one year later than the American Asylum for the Education and Instruction of the Deaf and Dumb at Hartford, Connecticut, but it had an independent origin.

The school was founded as a private philanthropy for all who were unable to pay tuition; but when the enrollment increased, the school was compelled to ask assistance from the State. This first came in the form of a lump appropriation of \$10,000. Since then the school has received other general appropriations, but most of the assistance from the State and later from the City has been in the nature of annual per capita appropriations.

HISTORICAL BACKGROUND

Other institutions, as these schools were originally called, soon followed. Le Couteulx St. Mary's Institution for the Improved Instruction of Deaf-Mutes, now known as St. Mary's School for the Deaf, in Buffalo, started in October, 1859. The Institution for the Improved Instruction of Deaf-Mutes, now the Lexington School for the Deaf, in New York City, opened in March, 1867. St. Joseph's Institute for the Improved Instruction of Deaf-Mutes (St. Joseph's School for the Deaf), also in New York City, opened in 1869. The Central New York Institution for Deaf-Mutes (Central New York School for the Deaf), at Rome, New York, opened in September, 1875. The Western New York Institution for Deaf-Mutes (Rochester School for the Deaf), in Rochester, opened in October, 1876. The Northern New York Institution for Deaf-Mutes (Northern New York School for the Deaf), at Malone, opened in September, 1884. The Albany Home School for the Deaf, at Albany, opened in 1891, was discontinued in 1922.

All of these Schools were incorporated as private institutions, and all now existing receive per capita allowances from the State. The buildings and grounds are owned or leased by the schools, some have considerable endowment and others little or none. All are under the supervision of the State Education Department and are subject to the rules and regulations of the State Department of Public Welfare. They are governed by self-perpetuating boards of directors who have the power of appointment of officials and employees.

Deaf children, prior to 1922, were appointed to these schools on two bases.

1. Children twelve years of age and upward were known as *state pupils* and were appointed by the State Education Department.

2. Children between the ages of five and twelve years were known as *county pupils* and were appointed, or committed, by the poor officers of the counties from which they came.

HISTORICAL BACKGROUND

The status of county pupils was determined to a large extent by the attitude of the charity officials. Some of these practically demanded that parents take the paupers' oath to enable their children to enter school, because few of them were able to pay tuition in a residential school.

Fortunately in 1922, the law regarding county pupils was abolished so far as new pupils were concerned and automatically all pupils became subject to state appointment after reaching seven years of age.

The three residential schools of the City from time to time received some day pupils, especially those living within easy traveling distance of the school; but, owing to some misunderstanding with the State Board of Charities (State Department of Public Welfare) and the State Education Department, these schools were ultimately forbidden to receive any more day pupils. This ruling worked a great hardship upon some children whose parents refused to send them to a residential school. It also increased the expense to the State when near-by pupils were appointed on a residential basis.

Realizing that a large percentage of its pupils would continue to come from the City, the Trustees of the Lexington School in 1908 offered to turn its entire plant over to the City for a day school for the deaf. The only conditions were that the City was to assume a small indebtedness on the buildings, and that the City retain as many of the teachers as desired to remain. This offer met with a favorable response from the Superintendent of Schools because the indebtedness was trifling in comparison with the value of the plant, and because the school used oral methods which he favored. There were many delays. Finally, the Rev. Dr. H. Pereira Mendes, believing there was need for both the Lexington School and a day school, made provision for paying the debts of the school, thus enabling it to continue as a residential school.

In 1905, efforts had been made to provide for the education of deaf children under the direction of the New York City

HISTORICAL BACKGROUND

Board of Education. For more than thirty-five years, there had existed in the city, three residential schools for the deaf. Today it is hard to understand why City and State authorities failed to agree upon plans whereby these schools could expand sufficiently to receive all pupils of proper school age. They were incorporated for that purpose and had received deaf children as far as their means would permit. There was, however, a state provision that no parent of a deaf child could be compelled to send it to an institution or a residential school. This provision worked a great hardship on a number of deaf children whose parents refused to send them to such a school, and for whom there was no provision elsewhere. Even when parents wished their children to be in school, there was no assurance of appointment until the children had attained the age of twelve years. In addition to all this, these residential schools were not permitted to receive children of recent immigrants or of parents with no fixed abode.

With these difficulties in mind, Dr. Mendes, in 1907, wrote the Board of Education asking them to make provision for the education of the deaf of the City. This request met with favorable action by the Board, and the Elementary School for the Deaf, known as Public School 47, was opened in September, 1908. Miss Margaret A. Regan, an experienced teacher of the deaf, was the first principal, serving till her death in 1910. The teachers then and for several years thereafter were recruited mainly from the residential schools for the deaf in New York City and other parts of the country. In the beginning, the curriculum followed was that of one of the oral residential schools, the Lexington School for the Deaf.

Miss Carrie W. Kearns succeeded Miss Regan as principal. Following in the footsteps of the Horace Mann School in Boston and the public day schools of Chicago, she and others set about revising the curriculum to make it parallel as far as possible the work of the regular elementary grades for hearing children. Educators familiar with the problems of the deaf, and teachers from the regular elementary schools worked jointly in this revision.

HISTORICAL BACKGROUND

These revisions resulted in allowing approximately two years for deaf children to do in language what the hearing children did in one during the first three or four years, with lesser modifications in other subjects. The problem was complicated at the Elementary School for the Deaf by the presence of a large number of children who had a fair command of English before their hearing was impaired and by a large group who had some hearing losses but who should have received the major part of their instruction through the ear. Neither group was properly segregated, and neither fitted properly into classes with children who were deaf from birth.

Classes for the deaf were also established in Brooklyn and in Queens and were under the direction of the principal of the parent school. After a few years, however, these classes were discontinued on the ground that better grading could be had by transferring these children to the Elementary School for the Deaf.

There is ample evidence that throughout the history of the education of the deaf some thought was given to the needs of persons with varying degrees of hearing loss. Methods of teaching children and later for teaching adults to read the lips of a speaker were developed.

In 1920, Lynn, Massachusetts, and Rochester, New York, opened the first public school classes in lip reading for the hard of hearing children. Lip reading as compensatory education is now accepted in many communities through the United States. In 1935, under Board of Education sponsorship and W.P.A. financing, over 3,000 New York City children were receiving lip reading instruction from 125 teachers.

In recent years rapid strides have been made in the development of individual and group hearing aids opening up still wider opportunities for the education of all acoustically handicapped children whether they are in attendance in regular classes for the normally hearing, or in special day or residential schools for the deaf.

Types and Causes of Deafness

LIFE MAY be divided into three major physical epochs: youth, middle age, and old age and, although there are many variations, on the average each of these epochs may be subdivided into three periods as follows:

YOUTH	Early	1 - 2 yrs., inclusive	Infancy
	Middle	3 - 12 yrs., inclusive	Childhood
	Late	13 - 20 yrs., inclusive	Adolescence
MIDDLE AGE	Early	21 - 30 yrs., inclusive	Prime of life
	Middle	31 - 40 yrs., inclusive	
	Late	41 - 50 yrs., inclusive	
OLD AGE	Early	51 - 60 yrs., inclusive	Declining years
	Middle	61 - 70 yrs., inclusive	
	Late	71 -	

In all of the physical epochs from infancy to old age there are variations in the incidence and prognosis of disease in general and particularly of those diseases which are prone to involve the mechanism of hearing. The highest incidence occurs after infancy, when the child is able to wander from the protective presence of the mother, the nursery and immediate home surroundings, when the child is exposed to more and greater trauma and more and greater infections than previously experienced.

A child who has a hearing loss suffers the emotional strain of undeserved scoldings, insults, misunderstandings, crude jokes and ridicule. He may hear only a part of what is said, or he may acquire only partial phrases and faulty articulation because of deficient hearing. The result may be an increasing retardation because of lagging education and adjustment to life. The inevitable emotional disturbance leads to an unhappy life. This may occur even though the hearing loss is unsuspected in the growing child.

The incidence of the four principle types of ear disease in school children is shown by an analysis of 2,709 children all of whom received at least two otological examinations (at intervals of six months to two years) by a project otologist. The follow-

TYPES AND CAUSES OF DEAFNESS

ing tabulation shows the incidence found by the first examination:

1,307 Non-suppurative otitis media, chronic or recurrent.	
6 and 7 yrs.	24
8 and 9 yrs.	300
10 and 11 yrs.	555
12 and over	428
1,451 Suppurative otitis media, healed, recurrent, residual or adhesive or with evidence of suppuration in the past without patients' or parents' knowledge or remembrance. (past masked)	
6 and 7 yrs.	36
8 and 9 yrs.	369
10 and 11 yrs.	597
12 and over	449
336 Suppurative otitis media, chronic (ears discharging at the time of examination).	
6 and 7 yrs.	11
8 and 9 yrs.	61
10 and 11 yrs.	139
12 and over	125
196 Nerve deafness, with or without accompanying otitis media.	
6 and 7 yrs.	2
8 and 9 yrs.	33
10 and 11 yrs.	82
12 and over	79
<hr/> 3,290 — total number of diagnoses	<hr/> 3,290

The discrepancy in the total of diagnosis (3,290) and the number of cases (2,709) examined is due to the fact that 581 children had a differing diagnosis in the two ears, or a nerve deafness accompanied or preceded by a suppurative otitis media in the same ear.

If the children had been seen at an earlier age almost all would have shown similar conditions. It must also be kept in mind that thousands (73,730 in New York City) of non-deafened children (those showing less than 9 decibels loss with the 4A audiometer) gave histories of past ear disease and frequent head colds. Many of those children will later show ear disease and deafness. Thirty-five per cent of the deafened children gave no past history of ear disease, and yet showed definite signs of present or past ear pathology. The importance of periodic testing and otological examination for all school chil-

TYPES AND CAUSES OF DEAFNESS

dren is clearly indicated. It is the only practical way to uncover the cases of potential or actual deafness.

It is a comparatively simple matter to test the hearing of children after they have entered school, but it is difficult and often impossible accurately to determine the hearing of children below the age of four. Nevertheless, it is in these early ages that detection is most valuable, particularly from the preventive standpoint. The great majority of children who have developed hearing loss have had in early life some general upper-respiratory tract abnormalities. The incidence of the respiratory infections is greatest in the winter and early spring.

At the second examination there was not only a shift of all diagnostic groups into the older ages but also a shift toward the less active otitis groups. There was less chronic suppurative otitis media. A marked shifting of individuals was noted, more into than out of the deafened category, i.e., those showing over 9 db. losses.

The hearing losses and the number of diseased ears increased with the age group and with little change in history or type of disease. This tends to substantiate our personal statistics concerning progressive deafness in youth from suppurative otitis media. It may be noted that suppurative diseases of the middle ear with their aftermath occupy most of the picture. In all probability, a great majority of the non-suppurative otitis media cases had really been suppurative at some time in the past, though diagnosed as non-suppurative because at the time of the examination no signs of suppuration remained.

External Ear

The auricle (outer ear) is continued inward by a tube which leads to the drum of the ear. This tube (external auditory canal) consists of skin mounted on cartilage at the outer, and bone at its inner end. In the outer part of the canal there is secreted a waxy substance called cerumen which normally lubricates without macerating the skin of the canal. It occasionally becomes caked and shuts off the canal, causing deafness.

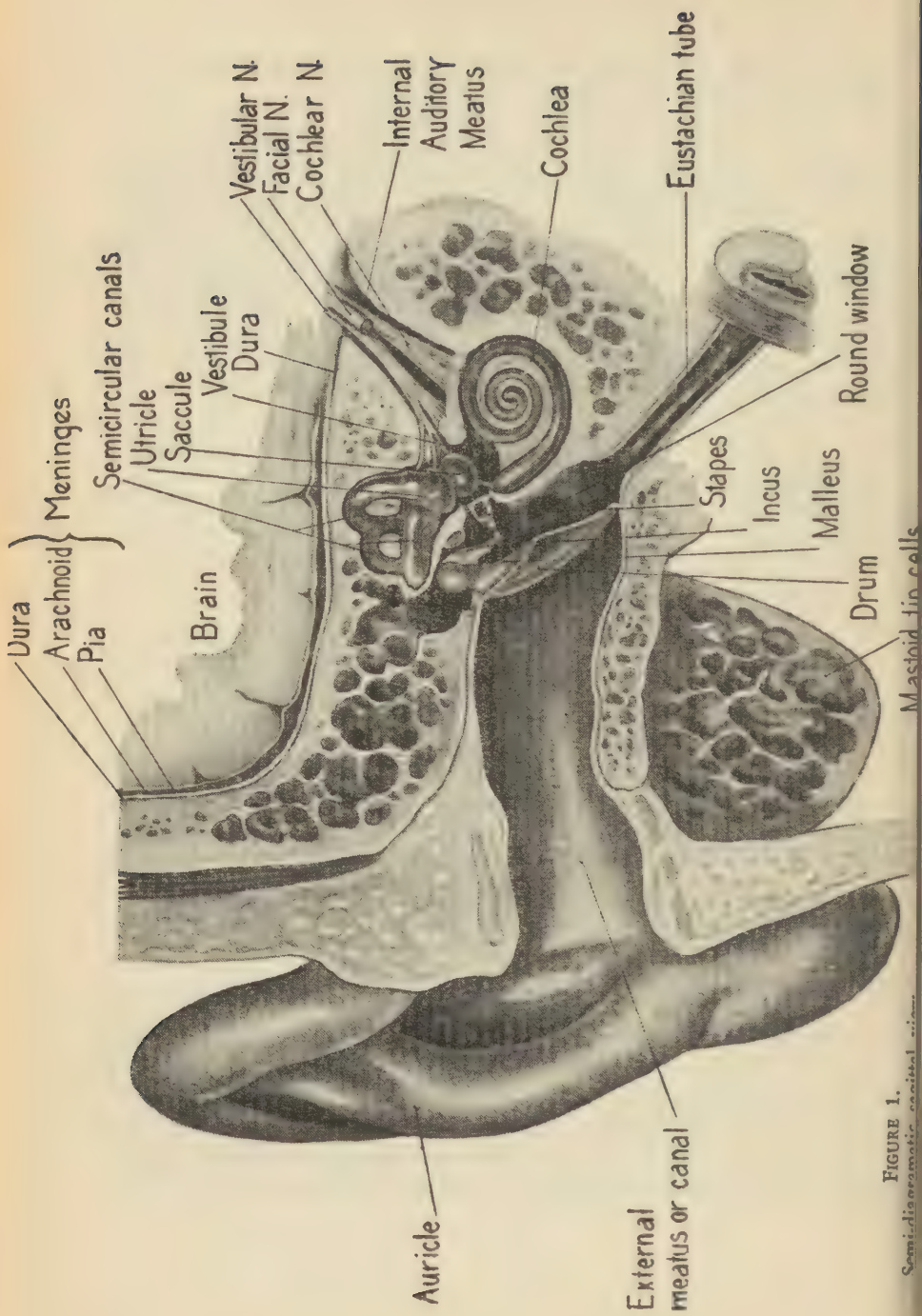


FIGURE 1.
Sagittal section of the human ear.

TYPES AND CAUSES OF DEAFNESS

Children often poke foreign bodies such as beads, peas, erasers, or wads of paper into the canal and insects may crawl into it. As a rule all these foreign bodies should be removed by a physician.

The external canal is often an ideal place for growth of yeast, fungi, and bacteria, the presence of which causes itching. Scratching the canal with finger nails, tooth picks, or hair pins, breaks the skin and permits infection to get into the deeper tissues. Furuncles (little boils) of the external canal may develop from such conditions, and the external canal may become very painful and completely closed by swelling.

Acute inflammation of the canal is very common from bathing in indoor swimming pools or at the beaches. Children do not properly dry their ears after swimming and fungi floating in the water readily implant themselves in the external canal. Chronic inflammation may result (chronic external otitis). Scarring of the drum may result and occasionally the middle ear may be invaded with reduction in hearing. The treatment of external otitis should be directed by an otologist.

One of the bones of the skull is the temporal bone. Within the so-called petrous portion of this bone lie the middle ear and the inner ear. It is in the inner ear where sound waves are transformed into nerve impulses which are interpreted by the brain. This transformation is a complicated process and involves transforming the mechanical energy of sound into electrical energy (nerve impulses).

Middle Ear

When sound reaches the inner end of the external auditory canal, it comes in contact with the ear drum. To the inner surface of this is attached a tiny bone called the *malleus* which through a second small bone is connected to a third bone which fits tightly into the labyrinthine window of the inner ear. This third bone, the *stapes*, is surrounded by an *annular ligament* which permits it to move in and out very much like the plunger

TYPES AND CAUSES OF DEAFNESS

of a pump. The above three small bones (ossicles) lie in the small air cavity of the middle ear, which connects through the Eustachian tube with the nasopharynx. Interference with their function produces middle ear deafness — so called conduction deafness.

The Eustachian tube is short in infants, and because they so often lie on their backs for long periods, the mucous from the back of their noses tends to run directly over or into the mouth of the Eustachian tubes. This by extension may cause infection in the middle ear, causing temporary and sometimes irreparable deafness. In older children and adults, the middle ear frequently becomes infected by the forcing of foreign substances into the Eustachian tube while blowing the nose. If the middle ear remains for any length of time without free drainage, inflammation or abscess may develop.

During infections of the middle ear, its mucous lining swells, and may, by tearing or exudation, allow blood, serum, and white blood corpuscles to accumulate in the middle ear cavity. This accumulation may cause so much pressure that it often ruptures the ear drum. Such spontaneous ruptures, may or may not occur in a part of the drum that is important for hearing. There is much less chance of a permanent deafness resulting from a perforation of the drum if the perforation is made artificially by a surgeon.

As a child grows older, the air-filled membrane lining the middle ear cavity pushes outward into the surrounding bone marrow which is then replaced by air cells. Because the air cells are made up of out-pouchings from the middle ear, they also become involved whenever the original middle ear pouch becomes infected. The outpouchings may be so extensive as to take up most of the temporal bone. The major extension usually occurs in that part of the temporal bone behind the external canal called the mastoid. The opening between the mastoid cells and the middle ear may become narrowed due to infection. If the more peripheral cells cannot drain into the middle ear a

TYPES AND CAUSES OF DEAFNESS

serious infection may develop in the mastoid. If these cells drain intermittently into the middle ear there may result a long standing drainage which eventually causes adhesions, scars and increasing deafness.

Most cases of otitis media (infection of the middle ear) if they are properly taken care of at an early stage, do not require an operation on the mastoid bone. Since colds are a primary cause of ear infections, children with colds, especially if they have had a previous attack of otitis media, should be put to bed. A few days out of school, even if they cause a child to repeat the year, are worth taking if they save the child's hearing. If a child has pain in the ears or running ears, he should be sent at once to a private otologist or to an ear, nose, and throat clinic. Children who have repeated attacks of ear trouble almost always have sinusitis and infected adenoids which need attention. If this is not done the little bones in the ear become more and more bound down with scar tissue producing a middle ear conduction deafness, the common type of deafness found in school children.

Inner Ear

The conduction mechanism, that is, the external canal, the drums and the ossicles normally lead sound to the inner ear. The latter is called the labyrinth. It consists essentially of three parts; the three semicircular canals which are concerned exclusively with equilibration; a snail-shaped structure called the cochlea which is concerned exclusively with hearing; and a connective portion called the vestibule which is concerned with both equilibration and hearing. The foot-plate of the stapes, which is the end of the conduction mechanism of hearing, fits into the bony capsule of the vestibule. The hole in the capsule which is filled by the foot-plate of the stapes is called the oval window.

The vestibule is filled with a fluid called perilymph, which is set in motion by the vibrating movements of the foot-plate of the stapes in the oval window. As fluid is non-compressible,

TYPES AND CAUSES OF DEAFNESS

when the perilymph is set in vibration, the entire contents of the labyrinth vibrates; including the thin membrane of the round window. This is the escapement or secondary opening into the inner ear.

Following the ascent of the spiral of the cochlea is an elastic structure called the basilar membrane which is narrow

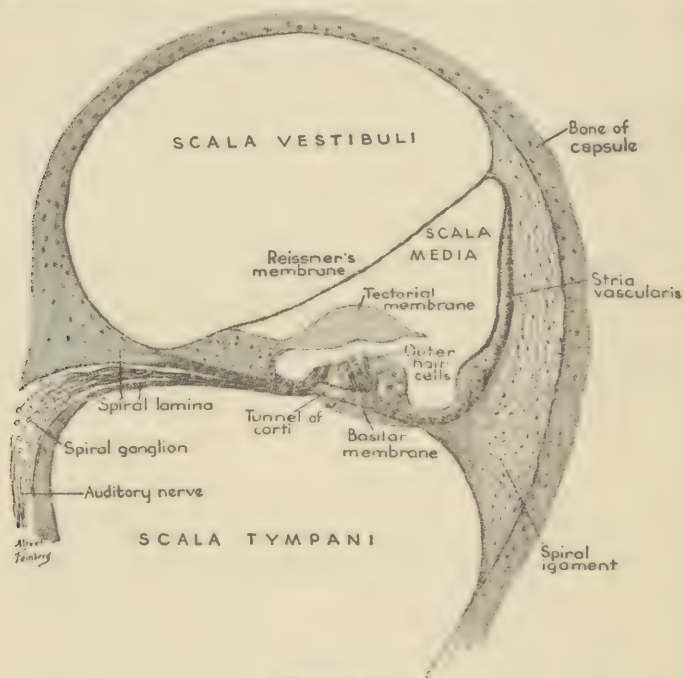


FIGURE 2.*

Cross section through one of the basal turns of the spiral of the cochlea showing the end organ of hearing.

* Reprinted from an original drawing for *Medicine of the Ear*, Editor, E. P. Fowler, Jr.; Thomas Nelsons & Sons, New York, 1939.

at the lower end and wide at the base or upper end like a very long xylophone. When the stapes transmits quick vibrations (high-tones) into the perilymph, it causes the lower end of the basilar membrane to vibrate. This end of the membrane is the narrowest end, and corresponds to the short bars

TYPES AND CAUSES OF DEAFNESS

on the xylophone which produce the high notes. Similarly, if the foot-plate of the stapes transmits long slow vibrations such as are produced by low notes, the basilar membrane resonates most powerfully in its upper turns where it is relatively wide.

On top of the basilar membrane as it spirals from below is an extremely delicate mechanism for picking up vibrations and transforming them into nerve impulses. This mechanism is made up of small cells topped with fine hairs called "hair cells," and surrounding the base of these hair cells are the filamentous terminations of the nerve of hearing (called the acoustic nerve, or the cochlear portion of the 8th cranial nerve).

This nerve passes into the lower part of the cranial cavity and enters the upper part of the spinal cord where the nerve fibers reach their first end-stations (central nuclei). Impulses from the end-stations are then divided and half are sent to one side of the brain and half to the other, so that one may hear perfectly if only one side of the brain be intact.

Congenital deafness is usually due to improper development of some part of the complicated structures of the ear. It may fall into the classification of conduction or perception nerve deafness. It is usually the latter. Occasionally the cochlea does not form at all.

Since the spinal fluid which bathes the surface of the brain runs directly into the perilymphatic spaces, infection of the covering of the brain often involves the perilymphatic spaces, destroys the delicate structures within the cochlea, and causes inner ear deafness. Mumps occasionally does the same thing, although the meningitic phase of mumps is usually not clearly apparent. More common than these mass destructions of the inner ear mechanism are partial destructions of the inner ear mechanism by toxins, poisons, or traumatic injury. Scarlet fever, diphtheria, pneumonia, and typhoid are examples of general diseases which may produce inner ear deafness. Poisons such as tobacco, either with or without coffee or alcohol and also infected teeth, tonsils, or sinuses, sometimes produce inner ear

TYPES AND CAUSES OF DEAFNESS

lesions. Other causes are quinine, salicylates such as aspirin, arsenic such as salvarsan, lead from paint or bad plumbing, coal-tar dyes, and carbon monoxide such as is found in illuminating gas.

There are many other poisons, which because of idiosyncrasy or overdose may cause loss of hearing. They usually reach the inner ear indirectly through the blood or lymph streams. Long continued or extremely severe infection of the middle ear may allow the seepage of toxins through the round window and produce direct poisoning of the delicate nervous structures within the cochlea.

Fracture of the skull, severe concussion, loud noises such as rifle, and artillery fire, fire crackers, riveting, and the clash of a boiler-maker's hammer etc., may produce nerve deafness. Unfortunately, for differential diagnoses, all of these causes of inner ear or nerve deafness tend to produce similar clinical pictures and pathologic findings. In the early stages of the destruction of the cochlea, there is usually ringing in the ears and deafness merely for high notes. There may be slight dizziness and nausea. In the later stages these symptoms may increase, but always hearing for the high notes is more affected than hearing for the low notes. This does not indicate that a loss of high notes necessarily means that nerve deafness is present, for even tightly plugging the ear with cotton or wax may produce more loss of the high notes than of the low notes, and stopping up the Eustachian tube with adenoids may do likewise. One can be certain of neural lesion (one beyond the conduction mechanism) if the deafness is total.

Occasionally tumors develop in the acoustic nerve. Certain diseases of the central nervous system such as cerebrospinal syphilis, congenital or acquired, multiple sclerosis or encephalitis may produce lesions in the acoustic nerve nuclei and cause deafness.

These diseases, toxins, poisons and traumas may involve the semicircular canals as well as the cochlea. If they do, there is

TYPES AND CAUSES OF DEAFNESS

first dizziness, and then nausea and later with complete destruction of the vestibule and organ (the part of the labyrinth having to do with the equilibrium) there develops a compensation, and the patient then has no difficulty with his equilibrium except in the dark. Many children are so young when they acquire their nerve deafness that they are unaware of the symptoms mentioned above and they may be too young to be tested with the audiometer. Turning these patients in a revolving chair to test equilibratory mechanism may show complete loss of vestibular response. When this is so, one may assume complete loss of hearing; for the cochlea is much more sensitive than the vestibular apparatus, and rarely if ever is the auricular equilibratory apparatus destroyed and the hearing saved.

Mixed Deafness

Both conduction deafness and nerve deafness may be present together. In fact, as mentioned before, after long-continued suppuration or severe toxic inflammation of the middle ear, some nerve deafness usually occurs, and of course there is then always some residual conduction deafness for the low as well as for the high tones.

There is a bone disease of the capsule of the labyrinth called otosclerosis which often begins at the time of puberty and when it involves the foot-plate of the stapes, it causes a conduction deafness, usually progressive. These cases usually develop nerve deafness for the high tones in later years.

Detection and Diagnosis

It is not the function of parents or teachers to make a scientific medical diagnosis as to the cause and type of hearing loss. It is their duty to detect the presence of a hearing loss, which after all is only one of the symptoms accompanying or caused by ear disease.

The following are some of the signs and symptoms accompanying ear disease and hearing loss. Any or all of these

TYPES AND CAUSES OF DEAFNESS

may occur without any ear disease, and many without any disease. Contrariwise, severe symptoms, even total deafness, may occur in one ear and not be noticed, particularly if it occurs in the presence of a severe illness. Parents and nurses are generally near the sick bed and their voices and gestures are therefore more readily understood than when the child is further from the speaker.

1. Deafness, dullness, heaviness or blocking sensations in the ears persisting for more than a few minutes, especially after exposure to cold, swimming, head colds, chronic or recurrent sinusitis, fatigue, shock or other causes of lowered resistance; also after trauma and severe or prolonged acoustic shocks.
2. Hearing better than others in a noisy place.
3. Asking for a repetition of words or phrases (seeming stupidity in understanding or apparent inattention to conversation).
4. Failure to respond when called or properly to locate the source of a sound and in consequence going in the wrong direction when responding to a call.
5. Retardation in school. Repetition of grades (this is on the average directly proportional to the hearing loss).
6. Distortion of speech out of proportion to age. This may be due to word deafness, congenital or acquired from other than ear disease.
7. Backwardness in learning to talk. Failure to acquire a considerable vocabulary by three years of age indicates that a careful examination should be made to determine what is wrong.
8. Buzzing in the ears (tinnitus), or dizziness (vertigo). These two symptoms may also be caused primarily by head colds, sinus disease, or foreign bodies in external meatus, arteriosclerosis, anemia and certain circulatory, neurologic and gastro-intestinal conditions. Jumping of the eyeballs (nystagmus) especially if associated with vertigo.

TYPES AND CAUSES OF DEAFNESS

9. Headaches, fever, sweats, chills, acidosis, vomiting, coma, otherwise unexplained.
10. Tenderness, itching, heat or pain, deformities or swelling in or about the ear.
11. Moisture or discharge, running or odor from the external ear canal.
12. Facial spasm or facial paralysis.
13. Allergic and neurological symptoms correlated to any of the above.

How may one determine whether or not a child has a noticeable hearing loss? If after repeated tests there is no response to sounds within the capacity of normally hearing children, the child has definite hearing loss or is in some way abnormal. Total deafness is not difficult to detect. Even the new born child will move his head when he hears a loud sound suddenly placed near one ear; a definite and consistent contraction of the pupil from applied sound is positive evidence that the infant is hearing.

The attentive normal hearing child should easily hear and understand a whisper made with residual breath at least 20 feet from the speaker in a large, quiet room. Only words and phrases the child knows should be used. The child should be trained to repeat them before the testing begins. If this is not possible, the child should be trained to respond to certain loud sounds such as those from a bell, clapping the hands, shouting the child's name, or the names of things that the child knows and is fond of, such as mama, dada, pussy, bottle, etc. Attempts should be made to obtain responses at greater and greater distances and when the child is out of sight (preferably in another room) under another person's observation. It is sometimes difficult for an untrained person to test a little child because the responses may be misinterpreted. A great obstacle in detecting deafness in little children is a parent's aversion to admitting the defect. It sometimes requires several years before the defect is acknowledged.

TYPES AND CAUSES OF DEAFNESS

A test should not be unduly prolonged. Little children tire easily and it is therefore difficult to hold their attention over long periods of time.

It is convenient to designate the degrees of hearing loss according to the table prepared by Dr. Edmund Prince Fowler, which follows:

	<i>Loss in Decibels</i>	<i>Degrees of Deafness</i>	<i>Loss of Hearing for Speech at 5 feet. *</i>
I.	Not more than 20 db.	Slight	Usually not noticeable but faint whispers often not understood. Hearing aids not used. *
II.	Over 20 db. and not more than 40 db.	Moderate	Soft or poor articulation often not understood. Cannot hear at theatres or church. Lip reading indicated. Hearing aids often unnecessary. *
III.	Over 40 db. and not more than 60 db.	Moderately marked — Moderately severe	Moderately loud articulation often not understood. Lip reading and hearing aids indicated.
IV.	Over 60 db. and not more than 80 db.	Marked (or severe)	Even loud articulation often not understood. Lip reading and hearing aids of great benefit.
V.	Over 80 db.	Very marked Very severe	Very loud or shouted words often not understood. Lip reading invaluable. Hearing aids often of little benefit.
VI.	No hearing	Total deafness	Very loud shout not heard.

* I and II apply more particularly to obstructive deafness. Nerve deafness of less than 40 db. in speech tones causes less inconvenience at conversational distances than obstructive deafness. Losses as great as 10, or even 20 db., may in noisy surroundings be considered low normal hearing.

Roughly speaking, if the voice or whisper is heard twice as far by one small child as by another, it means that the latter has a loss of some 6 to 8 decibels as compared to the former. (If three times as far, it means a difference of about 10 to 12 decibels). Nine decibels is the standard for screening out school children with hearing loss. This is roughly equivalent to 1/2 the normal hearing distance, and is therefore sufficient hearing loss to warrant segregation for careful study.

TYPES AND CAUSES OF DEAFNESS

In making all hearing tests, it should be kept in mind that outside noise is not heard by a child with a hearing loss from conduction lesions as readily as by a normally hearing child. The child with such hearing loss is therefore always living in a more quiet place than the normally hearing child. However, in the presence of noise everyone automatically tends to raise the voice, and this may make it better heard by the child with a hearing loss, than by the normal hearing child. It is therefore important to carry out the test in a sound-damped room, whether or not the normally hearing children are to be used as controls. Unless this is done, the children with a hearing loss may appear to hear much better than is really the case.

Methods for Detecting Hearing Loss

A great many children have so little hearing loss, and lip-read so well that it is extremely difficult except with precision instruments to detect the hearing loss. An instrument (the phonograph audiometer) has been developed which will quite adequately "screen out" the children in a class who have a hearing loss. It consists of an electric phonograph with records which can be heard through a number of telephone receivers (up to forty receivers at a time). The records played on this phonograph consist of numbers spoken by men and women first in a loud tone and then in diminishing intensities. These numbers if heard are written down on prepared forms with the receiver on one ear, and then on the other.

The ten spoken numbers are heard first very loud and then step by step represent a definite diminution in intensity of sound. There is 3 db. difference between each step. When the child no longer hears the numbers, he cannot write them down, and his card at the end of the test will therefore indicate the approximate loss of hearing. If he does not hear the last three numbers, he is considered to have a 9 decibel loss (each step is 3 decibels). It has been found by experience that any child having a loss of 9 decibel or more is to be suspected of having either a loss of hearing or an incipient loss of hearing. Those

TYPES AND CAUSES OF DEAFNESS

children therefore should be referred for further examination and check up. Sources of error in the test may be obviated by proper care in giving the test, and by repeating the test on all children who appear to have 9 decibels loss or more.

Diagnosis of the type of deafness cannot be made with the phonograph audiometer test described above. All children who fail to hear the numbers down to lower intensities must be re-tested by more accurate means. This is best done with an instrument called a "pure tone audiometer" which produces pure tones with controlled intensity (loudness) and pitch (frequency) in the hearing range. The most practical audiometers for ordinary use are graded in octaves and usually begin one or two "C's" below middle C (256 cycles) on the piano, and go up to one octave beyond the highest "C" on the piano, that is, they are arranged to test 128, 256, 512, 1024, 2048, 4096, and 8192 cycles or double vibrations of sound per second. The intensity of these notes can be varied from a point below audibility to levels 70 to 120 db. above the threshold of hearing, that is from below minimum audibility to the intensity of a very loud shout close to the ear. These sounds are produced in the audiometer telephone receiver which when placed upon the ear transmits them to the ear by way of the air in and about the ear.

The audiometer can also activate an instrument called a bone-conduction receiver which permits one to hear the test sounds when the foot plate or button of the bone-conduction receiver is placed against the skull. Both the air-conduction receiver and the bone-conduction receiver are calibrated in the same units, i.e., decibels, so that if charted together (using the same normal base line) one can compare at a glance the air and bone conduction findings. In nerve deafness, the bone conduction is always reduced. If the cochlea is even partially destroyed one could hardly expect it to retain good hearing either by air or by bone conduction. On the other hand, if deafness is due to a lesion in the outer or middle ear, the cochlea may remain intact and so will pick up sound transmitted to it from the skull quite as well as any normal cochlea;

TYPES AND CAUSES OF DEAFNESS

that is although the perception of air-born sound will be reduced because it cannot pass through an obstruction in the outer or middle ear, the bone-born sound will be heard near normal, because the inner ear is normal and the vibrations are brought to it directly through the surrounding tissues.

Prognosis, Prevention and Treatment of Ear Disease In Children

It is commonly thought that ear disease with lowered hearing does not become chronic during the early years of life, and that if the ear is left alone, it will take care of itself. It is commonly thought that without a history of suppurative otitis the deafness is probably congenital and that nothing can be done about it. These beliefs are far from the truth, because although the tissues are inherently more responsive to treatment and tend to throw off certain infections and to heal more readily during the years of childhood, repeated inflammatory insults, often unrecognized, may lower resistance, establish hypersensitivity, and set up potential or actual ear disease and progressive deafness. Careful clinical and autopsy findings show that no child escapes some inflammation in the middle ear and adnexa.

On the other hand, even though theoretically possible, it is unwise so to restrict the activity of children that they live only in a sterile environment. Over-protection unfits an individual for a happy life in the real world.

If all children were examined otologically on entering nursery schools (not later than three years of age), many ear conditions would be detected in time for preventive treatment greatly to diminish the incidence and severity of deafness in later life. Nursery schools for the deaf and for the hard of hearing should be established as part of the educational system of every country. One of the most important activities of the American Society for the Hard of Hearing and its nation-wide membership is the furtherance of legislation to establish nursery schools for little children wherein they may be taught lip reading and proper speech in the presence of normal hearing children

TYPES AND CAUSES OF DEAFNESS

whenever possible. It must be remembered that these children must live their lives in a hearing world.

In the adult there appears to be a slow progressive loss of hearing with increasing age (and cardio-vascular disorders), often independent of inflammatory episodes in the ears, but in youth there is no such gradual loss of hearing without some inflammatory or non-inflammatory progressive lesion in the ears, and therefore the detection of even a slight drop or a slight progressive loss in hearing acuity is a warning signal not to be ignored.

The degree of deafness may or may not correspond with the virulence of the primary bodily disease or with the virulence of the ear infection. Even mild diseases of childhood, often undetectable and indistinguishable from one another, may prepare the ground for severe deafness, and it is therefore imperative that the ear and adnexa be carefully and constantly watched during and following the diseases of childhood.

The factors entering into causation and prevention are too many and too variable to permit of a simple or universal means for their sure control, but early detection and an accurate diagnosis are the most practical and effective preludes to preventive treatment.

Regular and adequate hours of sleep, study, outdoor play, and the avoidance of crowds are good general preventive measures. Exposure to cold or draft especially when overheated is to be guarded against; diving and swimming under water are dangerous if there is any tendency to nose or ear infections. The logical and careful parent will properly clothe and adequately shelter and feed the child, and at the first sign or symptom of potential or actual ear trouble take preventive action. Fads and excesses in these matters should be avoided. A competent physician is the best guide as to the advisability of action and the choice of method.

It is now possible to protect children from several of the most dangerous infections and contagious diseases by properly

TYPES AND CAUSES OF DEAFNESS

timed immunizations. Immunization is not an unmixed boon to humanity if it results in forgetfulness of past experience or sets up an artificial immunity which does not protect as well as the natural immunity acquired through various and repeated self-controlled infections. Immunization confers a relative, never an absolute protection. Moreover, there is no surety of immunity from ear disease and deafness even though all the diseases of childhood are avoided.

In every individual up to a critical point which varies with the type, number, and virulence of the invading organism, and the type, speed, endurance and adequacy of the resistance of the host, no deafness results. Beyond that critical point permanent deafness is certain. Hearing is preserved and restored in direct proportion to the speed of limitation and resolution of the inflammation.

Too often parents and physicians allow the child to drift, hoping "nature" will eventually cure the ear trouble. Nature will seldom cure the disease or preserve the hearing if denied a reasonable chance. Procrastination definitely and often permanently lessens or denies a reasonable chance. Physicians are prone to treat diseases of the ear, and other organs, without giving adequate thought to the hearing, and to delay proper operative measures so long that irreparable damage occurs. The time element in prevention and in curative treatment is most important. Chronicity and recurrence will cause some deafness whether or not the otitis be ultimately conquered. Before, during, and after any disease, all treatment (medical and surgical) is really preventive and in the great majority of cases efficacious in conserving function.

Potential or actual ear trouble in youth is usually preceded by and prolonged by infection of the respiratory tracts, particularly those in the nose and nasopharynx, coincidental with diseased tonsils and adenoids. The exanthemata, especially scarlatina and measles, also diphtheria, mumps, whooping cough, influenza, and pneumonia take a heavy toll in diseased ears

TYPES AND CAUSES OF DEAFNESS

and hearing loss. Meningitis is far more deadly to the hearing than to life, and the hearing loss is final. There is no known way to restore the hearing. Syphilis may cause hearing loss in various ways, but early proper treatment will usually conserve the hearing. A positive Wassermann does not necessarily indicate that the ear disease is syphilitic in origin.

More children will be protected from hearing loss by early detection, followed by treatment of the cause than in any other way. With the exception of general hygiene, treatment without some indication or threat of ear disease is generally not to be expected. In children, the most usual and compelling indications for preventive treatment are ear ache, and the realization that there is an actual or potential hearing loss.

Delay in making an early quantitative diagnosis is in most instances the chief cause of permanent hearing loss.

The Committee acknowledges its indebtedness for material appearing in this chapter to Edmund P. Fowler, *Prevention of Diseases and Disorders of the Ears between the Ages of Three and Twelve Years*, *Preventive Medicine*, New York Academy of Medicine, New York, N. Y., June, 1938.

Scope of the Study of the Committee and Otological Findings

THE EXTENSIVE study dealing with the care and education of acoustically handicapped children of the public schools of New York City was undertaken by the Committee for the purpose of suggesting to the Board of Education an adequate program for meeting the medical and educational needs of acoustically handicapped children of school age and which would be far reaching in its influence upon the conservation of hearing and prevention of deafness. As a part of its program of study the Committee first examined preliminary data and reports submitted to it from various departments of the Board of Education describing various phases of the program now in operation for this handicapped group and also other reports dealing with previous studies of various phases of the general problems of acoustically handicapped children. The Committee then undertook the organization and prosecution of investigations of the problem in the following directions.

1. The testing of hearing

In order to establish the prevalence of hearing losses among New York City public school children, two large samples of the school population were given tests of hearing. One of these groups consisted of 30,592 elementary and high school children, to whom were administered the 4A audiometer screening test. Over a thousand of those indicated to have appreciable hearing losses were given pitch range audiometer tests and otological examinations. To the second sample consisting of 51,689 school pupils between the ages of six and one-half and twenty-three and one-half, the 4A audiometer test was also given. Pitch range audiometer (2A) tests were given to 907 of the cases in

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

this group who by the screening tests appeared to have impaired hearing.

All the pupils in P. S. 47, the New York City day school for the deaf were tested with the 2A pitch range audiometer.

2. Otological examinations

Six otologists examined, compiled histories, and made diagnosis of all pupils in P. S. 47, the New York City day school for the deaf. In addition, 500 children with hearing losses attending public schools for the normally hearing were selected for otological examinations. The results of the otological examinations of 100 cases in P. S. 47 and 100 cases attending schools for the normally hearing were compared for the purpose of study. In addition to the above direct otological examinations, the otological findings of 2,709 cases which had had at least two otological examinations under the WPA project, No. 6065, were analyzed by the Committee and the data compiled.

3. Summary of testing equipment provided by the Board of Education.

The Committee sent questionnaires to all schools and to the headquarters of the Board of Education in an effort to obtain information concerning the testing equipment available.

4. Summary of otological services provided by the Board of Education.

Questionnaires were sent to all schools and to the headquarters of the Board of Education in an effort to obtain information concerning the services provided for the acoustically handicapped.

5. Evaluation of educational programs provided by the Board of Education for acoustically handicapped children.

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

The Committee discovered that with the exception of the WPA Lip Reading Program no program was provided by the Board of Education for this group of children other than that given at P. S. 47, the New York City day school for the deaf. An evaluation of this program was made by more than 25 educators and social workers from large residential and day schools for the deaf and service organizations for the hard of hearing, as well as from public schools for the normally hearing, and reports were submitted to the Committee by each visitor. The evaluation of this program covered the following:

- Administration and supervision
- Enrollment
- Methods of referring pupils to the school
- Size of classes
- The building and the equipment
- Transportation of pupils
- Academic curriculum
- Utilization of residual hearing
- Vocational training
- Teacher training
- In-service training program
- Teachers' qualifications
- Guidance program and follow-up of graduates

6. Administering of intelligence tests, personality questionnaires and achievement tests to all the pupils of P. S. 47 in grades V to VIII, and the further evaluation of the effectiveness of the program offered in the light of the results of these tests.
7. Study of requirements for license to teach the acoustically handicapped.
8. Related Studies.

Intelligence tests, personality questionnaires and achievement tests were administered to approximately

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

300 acoustically handicapped children attending regular classes for the normally hearing for the purpose of comparing their achievements with those of normally hearing pupils of the same age and grade level.

Speech examinations were given to approximately 400 acoustically handicapped children attending the regular classes for the normally hearing.

9. Additional Studies

The Committee examined the findings of the Committee of the Inquiry into Problems Relating to Children with Defective Hearing carried on in London, England. They also assembled data pertaining to the program for acoustically handicapped as carried on by the New York State Education Department as well as by other city and state programs throughout the United States.

10. Additional Reports and Conferences

Individual members of the Committee also conferred on a number of occasions with the Associate Superintendent and Assistant Superintendent in charge of work with the handicapped, as well as with the former acting principal and the present principal of P. S. 47, The School for the Deaf.

11. Report of Teachers' Committee of P. S. 47

At the request of the Committee a group of teachers of P. S. 47 made an appraisal of their own program and procedures, and submitted to that Committee a report with recommendations.

OTOLOGICAL FINDINGS

Prevalence of Acoustic Handicaps Among New York City School Children

The Committee has based its estimates of the prevalence of acoustic handicaps among New York City children attending the public schools upon

- (a) the 4A audiometer testing of 30,592 elementary and

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

high school pupils; a pitch range audiometer (2A) testing of 1,080 of those children who were shown by the 4A tests to have a hearing loss of 9 decibels or more in one or both ears. This study was made for the Committee by the Executive Secretary of the New York League for the Hard of Hearing with the assistance of the Works Projects Administration.

- (b) the findings of a previous study conducted in the New York City Public Schools during the years 1934-1938 by an Assistant Director of Health Education of the Board of Education with the assistance of the Works Project Administration. In the course of this study more than 700,000 children were given 4A audiometer tests, of whom 35,000 were given pitch range audiometer (2A) tests. The published reports of this project were for the most part designed to show, for administrative purposes, the number of tests administered rather than the percentage of a given sample indicated by the testing to have specified hearing impairments. However, usable data for 643,318 cases tested on the 4A audiometer are presented in the 1935 report of this project.*

In the Committee's study of 30,592 children in sixteen schools the criterion of impaired hearing in a given ear as determined by the 4A audiometer was set as a loss of 9 decibels or more. The results of this testing are presented in Table I.

TABLE I

Prevalence of 9 Decibel or Greater Hearing Losses Among
30,592 Children in Sixteen Schools

<i>Type of School</i>	<i>Number of Schools</i>	<i>Number of Cases Tested</i>	<i>Percentage of Cases with 9 Decibel or Greater Loss</i>		
			<i>1 Ear only</i>	<i>2 Ears</i>	<i>1 or 2 Ears</i>
Elementary	4	5,657	8%	5%	14%
Junior High	5	6,649	6%	4%	10%
Day High	2	10,843	4%	1%	5%
Vocational High	4	7,443	5%	2%	8%

* Caplin, Daniel: Report on Civil Works Project 177 for the Conservation of Hearing of School Children, April 1, 1935. (Mimeographed, 18 pages.)

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

It is to be noted that the percentage of cases showing hearing impairment is considerably greater in the elementary and junior high schools than in the day high schools and vocational high schools. Although not shown in the table, wide variations in the percentages of acoustically handicapped pupils were found among the several schools of the same type.

As the numbers of cases tested in the various types of schools are not proportional to the numbers of children enrolled in each type of school, to obtain an estimate of the percentage of children in the general school population having 9 decibel or greater hearing losses, it was necessary to weigh the percentages shown in Table I by the enrollment in each type of school. For 2 ear cases this percentage was found to be 3.8%, for 1 ear cases 6.7%, and for one or two ear cases it was 9.1%.

The 4A audiometer is designed to test large groups of pupils at one time in order to screen out those having noticeable impairments in hearing or speech. To determine accurately the seriousness of the hearing losses and their implications for education it is necessary to test the children individually with the pitch range (2A) audiometer. Decibel losses as indicated on the 4A audiometer are not, however, directly comparable with decibel losses as indicated by the 2A threshold curves.

Of the 2,546 children indicated by the 4A audiometer testing to have hearing losses of 9 or more decibels in either or both ears, 1,080 were given otological examinations and pitch tone (2A) audiometer tests. The thousand and eighty children given these additional examinations were those of the 2,546 whose parents gave consent for the examination. No data are available to indicate the representativeness of the sampling but it is, of course, probable that cooperation of parents was obtained in a greater proportion of cases where the hearing loss was serious and had been previously noted by parents, than for cases having no readily apparent hearing difficulty except as indicated by the 4A audiometer testing.

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

Table II represents a summary of the results of the pitch range audiometer testing of the sample of 1,080 children, in terms of decibel loss in the better ear. At the various school levels, from ten to fourteen per cent of the cases selected by the group audiometer (4A) testing are shown by the pitch range audiometer (2A) testing to have losses of between 15 and 20 decibels in the better ear while from 22.1 to 35.9 per cent of the 1,080 children were shown by the pitch range audiometer to have hearing losses of 20 decibels or more in the better ear.

TABLE II

Sampling of Cases Showing Impaired Hearing on 4A
Audiometer Tests Distributed According to Hearing
Loss Shown by 2A Audiometer Tests

	<i>Elementary School</i>	<i>Junior High School</i>	<i>High School</i>	<i>Vocational High School</i>
No. of cases examined on 2A	312	352	219	197
Per cent having 15-20 db. loss in better ear	11.9%	10.0%	14.2%	10.2%
Per cent having 21-59 db. loss in better ear	23.7%	22.1%	34.0%	31.5%
Per cent having 60 db. or greater loss in both ears	1.3%	0.0%	1.9%	0.0%

The second source of data for estimating the prevalence of acoustic handicap is from the study conducted under the technical supervision of the Assistant Director of Health Education of the Board of Education. The testing procedure is described in the 1935 report as follows:

The surveying is done with the 4A audiometer, a machine which can test from 8 to 40 children at one time. All children discovered in the first testing as potential impaired hearers are given another test with the 4A audiometer. By this means any psychological element of fear or any unfamiliarity with the equipment is eliminated.*

* Caplin, Daniel: Report on Civil Works Project 177 for the Conservation of Hearing of School Children, April 1, 1935. (Mimeographed, 18 pages.)

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

In the 1935 report no statement is made regarding the criterion of impaired hearing, though in the 1936, 1937 and 1938 reports it is stated to be a loss of 9 decibels or more. The Assistant Director of Health Education, under whose close supervision these studies were conducted, states in a communication to the Committee that the same criterion was employed for all 4A testing, namely, impaired hearing is indicated by a hearing loss of 9 or more decibels.

Although this testing project is still in progress, reports later than that for 1935 give cumulative statistics for original tests and periodic retests combined, and hence the figures are not usable for estimating prevalence of acoustic handicap. The author of the reports of the project asserts, however, that the statistics presented in Table III, derived from data on pages 3 and 9 of the 1935 report, do not include retests, that is, no child with impaired hearing is counted more than once even though his hearing has been tested more often.

TABLE III

Total Number of Impairments Found on the Basis of
the 4A Audiometer Tests Administered to
643,318 Children in New York City

CHILDREN SHOWING 9 OR MORE DECIBELS LOSS

	<i>Elementary and Junior High School</i>		<i>High School</i>	
	<i>Number</i>	<i>Per Cent</i>	<i>Number</i>	<i>Per Cent</i>
Both Ears	19,280	3.17	594	1.62
Right Ear	25,501	4.20	1,277	3.47
Left Ear	23,316	3.84	1,015	2.76
Number of Children Tested	606,549		36,769	

Weighting the percentages given in Table III by the numbers of children enrolled in each type of school, the following estimates of prevalence of 9 decibel or more hearing loss for the general school population are as follows:

Both Ears	2.7%
Right Ear	2.7%
Left Ear	3.5%

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

A study to determine the prevalence of acoustic handicap at the various age and grade levels in a sample of 50,000 school children selected so as to constitute an accurate cross section of the school population was undertaken at the request of the Committee. The statistical consultants selected by the Committee employed procedures in collecting and treating the data which differed materially from those proposed by the Committee. The completed study appeared to present serious defects* so it has not been accepted as a basis for estimating the magnitude of the problem resulting from impaired hearing.

In the same letter a second source of error was stated to have been revealed by review of the data. It was found that an undetermined number of children shown to be handicapped on the first test were never subsequently reexamined, and were classified as normals since they did not have the two tests required by the criterion of acoustic handicap employed by the study. The extent to which prevalence of acoustic handicap was consequently underestimated could not be determined from the data available.

A revision of the report to have been undertaken in December 1940 was not made available to the Committee up to the time of going to press in May 1941.

* The report submitted by the statistical consultants indicated 3.2% of the 51,689 children to have hearing losses of 9 decibels or more in one or both ears. This finding was in marked disagreement with other data collected for the Committee and consequently the senior statistical consultant was requested to review the study conducted under his direction. Following a reanalysis of a portion of the still available data he reported in a letter to the Committee that the criterion of auditory disability, instead of being "a loss of 9 decibels or more in one or both ears" as stated in the report should have read as follows: "In the actual administration of the 4A audiometer for survey purposes, the technicians administered the test under prevailing classroom conditions. The papers were scored immediately. All children showing a score indicative of a hearing loss of 9 decibels or more in one or both ears were reexamined as soon as practical with the same apparatus. The total record was used as a basis of classification. A person was classified as suffering from auditory handicap if, on the basis of the total record, both ears showed a loss of 9 decibels or more, or, if on the basis of the total record, one ear showed a handicap of 12 decibels or more. Thus, the incidence reported is based on reexamined cases and reports all persons having two ear handicaps of 9 decibels or more in both ears, or single ear handicaps showing 12 decibels or more in the handicapped ear. The technicians prepared a table of age for each class, showing the number of children of each age who were given the initial test and the number of that total who would be classified as hard of hearing by the survey definition."

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

The Committee believes that one of the "significant selective forces operating" to cause fewer acoustically handicapped children to be found in the secondary schools was the failure on the part of the school authorities to discover the auditory disability of the children who were not able to reach the high school grades possibly because of their hearing handicap. If these children had been placed in the special classes in the public schools for the acoustically handicapped in which they normally belonged, a significant decrease in the prevalence of acoustically handicapped children in the secondary schools probably would not have been found.

Were it possible to have had a control group of the same age-group of children who are unable to attend high school because of an acoustic handicap, figures would probably be subject to revision. Although it is true that this is a study of the prevalence of auditory disability of children attending the New York Public Schools, these children might have been pupils in the high school grades at the time of this survey, were it not for the fact that a great number of them might have had to leave school because of their handicap and lack of facilities to enable them to overcome it or at least to compensate for it, such as by lip reading or hearing aids. There has not been a follow-up on the testing which would provide the facts to show whether this is the case or not.

The findings of the 4A audiometer tests should not be used for the classification of individual disability as it is only a screening test. It is the best method of screening available at the time and well serves the purpose. It should be followed by individual tests. The most important factor in a testing program is periodic retesting and follow-up. Periodic retest and follow-up cannot be accomplished without the preliminary use of the screening tests. If after a periodic test and proper treatment there is no improvement in hearing they must be carefully followed up and given the needed educational help.

THE ELEMENTARY SCHOOL FOR THE DEAF

The Study of P. S. 47—Test and Otological Findings:

Of 488 children in P. S. 47, 466 were tested as indicated below:

All hearing tests were made with pitch range Western Electric 2A audiometers. This differs from tests made in the others groups in that in the other 4A audiometers were used in addition to pitch range audiometers. Group testing (screening) was not possible in the group in P. S. 47 as the children had too great losses to be detected by group (4A) audiometers.

Results of Testing:

<i>Hearing Loss</i>	<i>Ages 5-9 Inclusive</i>	<i>Ages 10-13 Inclusive</i>	<i>Ages 14 and over</i>	<i>Totals</i>
No loss to 20 decibels loss	0	3	0	3
Over 21 to 40 decibels inclusive	1	15	13	29
Over 41 to 60 decibels inclusive	26	47	43	116
Over 61 to 90 decibels inclusive	39	94	70	203
Total Loss	31	51	33	115
	97	210	159	466

Hearing losses were analyzed to determined the frequencies at which the greatest losses occurred. The following tabulation shows the results of this study.

Hearing Losses	Ages 5-9		Ages 10-13		Ages 14-15		Ages 16 over		Total	
	B	G	B	G	B	G	B	G		
										(B—Boys, G—Girls)
Below 20 db. Greatest loss in high frequencies			1							1
Undetermined				2						2
Over 20 to 40 db. Greatest loss in low frequencies					1	1				2
Greatest loss in high frequencies	3		5	2	3	4				17
Undetermined type			4	4		1				9
Over 60 db. Greatest loss in low frequencies		2	2	2	1	1	1	2		11
Greatest loss in high frequencies	17	11	45	33	14	9	11	9		149
Sharp drop in speech tones	10	2	13	8	3	3	5	5		49
Undetermined type	12	13	31	9	16	11	10	5		107
Over 40 to 60 db. Sharp-drop in speech tones	3	1	4	4	2	3	3	2		22
Greatest loss in high frequencies	7	4	18	14	9	13	3	4		72
Sharp-drop in speech tones	8	3	3	5	1	1	2	2		25
Undetermined type										
Total Boys	60		126		50		35			271
Total Girls		36		83		47		29		195
	Total									466

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

Otological Examination of Pupils in Public School 47

Otological examinations were made on 400 pupils in P. S. 47. Diagnoses were made on the basis of the findings, history and audiograms. The diagnoses according to age groups are as follows:

<i>Diagnosis</i>	<i>Ages 5-9 Inclusive</i>	<i>Ages 10-13 Inclusive</i>	<i>Ages 14 over</i>	<i>Total</i>
Nerve deafness	60	121	90	271
Purulent Otitis	0	15	9	24
Mixed deafness	37	73	61	171
Otosclerosis	0	0	2	2
No otological	0	1	0	1
	<hr/> 97	<hr/> 210	<hr/> 162	<hr/> 469

On the basis of these examinations it was found that 314 of the 488 children enrolled (64%) were in need of otological or other medical treatment; special schools were not indicated by the examining otologists for 78 of the pupils enrolled and 88 pupils were recommended to a special school without careful and more detailed examination.

An examination of the otological records on file in P. S. 47 revealed that:

1. The histories are generally incomplete and inadequate as to previous ear history and dates.
2. Audiometer tests (previous to those given by the Committee) are vague as to dates and there are no graphs to indicate the type of hearing loss by air conduction; no bone conduction is recorded.
3. Otological examinations are incomplete in the great majority of cases; dates of examinations in many instances are not recorded.
4. Diagnoses appear to have been made wholly on the basis of the histories and hearing losses. No otoscopic data are mentioned. No bone conduction data are given. With a diagnosis of "Nerve Deafness" other ear pathology, when present, was not indicated.

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

5. Nose and throat examinations were apparently superficial. In many cases none were shown to have been made.
6. (a) Recommendations for "Special School" seem to have been made on air conduction hearing loss, without consideration of the possibilities of improvement of the hearing by treatment or hearing aids.
(b) Children for whom a recommendation of "No Special School" was made and recorded, nevertheless were found still in P. S. 47.
(c) There is no written evidence of any otological treatment having been given.
7. There is no evidence of medical follow-up.
8. Children whose hearing, according to the audiometer tests, has improved enough since admission to warrant transfer to regular school are still in P. S. 47. Reasons for continuing them in P. S. 47 were not revealed.
9. No record that otological follow-up had been made in suspense register cases.

Otological Findings—Exclusive of P. S. 47.

One hundred children who had previously had 41 audiometer tests were selected by the Committee for otological examinations and 2A audiometer tests and complete histories. Schedules were made out providing the following information:

- | | |
|-------------------------------|----------------------------|
| 1. Speech ability | 5. Findings |
| 2. 4A audiometer test results | 6. Diagnosis |
| 3. Past history | 7. General recommendations |
| 4. 2A audiometer test results | a. Medical |
| | b. Educational |

Children with a hearing loss of 9 decibels or more in either or both ears, were tested by the Pitch Range audiometer (Western Electric 2A).

The examination showed that 74 of the one hundred cases

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

had a hearing loss of less than 20 decibels in the better ear and 26 had a hearing loss of 21 to 40 decibels in the better ear. In the 100 cases the hearing loss in the worse ear ranged from less than 1 decibel to 90 decibels in the 74 children and 20 decibels to 65 decibels in the 26 children.

In making the above estimate the decibel loss for the better ear in each group was taken from either the speech range loss or total loss. That is, if the total loss was less than the speech loss, it was taken. This is contrary to custom as the speech loss range is the more important of the two. The reason for this selection was that it seemed best to be liberal in the selection of the better ear, it was selective of ability rather than of the complete amount of disability.

It should be noted that in the group of 74 cases (those having a loss of less than 20 decibels in the better ear but less than 40 decibels in the poorer ear) the loss in each ear was more uniform than the loss in each of the group of 26 children.

The otological examinations of the 100 selected children revealed the following conditions to be present:

- 24 had a Chronic Suppurative Otitis Media
 - 13 both ears
 - 11 one ear; other ear suppurative healed or nerve deafness
 - 6 had hypertrophied tonsils and adenoids.
- 5 had recurrent Chronic Suppurative Otitis Media
 - 1 both ears
 - 4 one ear; other ear Suppurative healed or nerve deafness
 - 2 had hypertrophied tonsils and adenoids.
- 79 had Suppurative Healed Otitis (including Residual Adhesive)
 - 45 both ears
 - 34 had different conditions, such as suppurative, recurrent, nerve deafness in either ear
 - 15 had hypertrophied tonsils and adenoids.

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

25 had Nerve Deafness

2 both ears

23 one ear; chronic suppurative, recurrent suppurative
healed or residual adhesive in the other

3 had hypertrophied tonsils and adenoids.

A similar study was made of 65 children who attended regular public school classes and also attended lip reading classes at the New York League for the Hard of Hearing. The ages ranged from 12 to 21.

Their 2A audiometer tests revealed that:

6	had hearing loss of 20 or more decibels in both ears
15	" 30 " "
15	" 40 " "
9	" 50 " "
5	" 60 " "
1	" 70 " "
9	from 25 to 70 decibels in worse ear and 5 to 15 decibels in better ear
5	had had no recent 2A tests

Otological examination revealed the following conditions to be present:

- 28 had Nerve Deafness, one or both ears
- 12 " Chronic Suppurative Otitis Media, one or both ears
- 7 " Healed Suppurative Otitis Media, one or both ears
- 7 " Mastoid Operation or Operations, one or both ears
- 11 " Chronic Non-suppurative Otitis Media, one or both ears
- 2 " Otosclerosis

A further study of otological findings by WPA project otologists was made of 2,709 cases that had at least two otological examinations, the second one from six months to two years later, showed the following:

1,307 Non-suppurative otitis media—	290 Suppurative chronic (ears discharging at time of examination)—
6 and 7 yrs. 24	6 and 7 yrs. 11
8 and 9 yrs. 300	8 and 9 yrs. 61
10 and 11 yrs. 555	10 and 11 yrs. 139
12 and over 428	12 and over 79
<hr/> 1,307	<hr/> 290

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

1,451 Suppurative healed, recurrent, residual adhesive, or evidence of suppuration in the past—	195 Nerve deafness, with or without accompanying otitis media—
6 and 7 yrs. 36	6 and 7 yrs. 2
3 and 9 yrs. 369	8 and 9 yrs. 32
10 and 11 yrs. 597	10 and 11 yrs. 82
12 and over 449	12 and over 79
<hr/> 1,451	<hr/> 195

In the great majority of instances, the second examination given by a second otologist confirmed the diagnosis made at the first examination. In every child ear pathology was found at each examination, the differences being only in degree or nomenclature. It was reported that there were some differences of opinion as to the presence of severity of the otitis media. However in some instances, the hearing showed marked improvement, the child having had intensive treatment for the ear condition before the second examination. Most of the children showing such improvement were below the age of twelve.

About 300 of the 2,709 children had a third otological examination, which confirmed the findings of the previous examinations.

Analysis of Data Reported in Other Studies

The report of WPA project 6,065 gives the average incidence of hearing disability as 3.33%. Medical examination of these children showed a large number, about 35%, who showed a hearing loss with definite evidence of ear disease in earlier childhood, and who gave no history of previous ear trouble. This emphasizes the importance of the periodic testing of all school children and their otological examination, as this is the only way in which those children can be discovered before it is too late to be of help to them. Of the 2,709 cases, the records show that 1,537 visits were made to clinics and 943 to private physicians after they had been examined by the project otologists who only made examinations and gave no treatment of any

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

kind. These visits in the vast majority of cases corroborated the findings of pathological conditions by the project otologist, but the hearing loss, past, present, and future were in most cases ignored. Children may often have great hearing losses without attracting attention, as they are natural lip readers, and in many cases the teacher speaks loudly and the noisy conditions favor them, particularly in conductive deafness.

The Bureau of Child guidance reported to the Committee that during the year preceding its study, forty-five of the children referred for psychological study or psychiatric treatment were found to have severe hearing losses which had not been detected or were not known to their schools which apparently were the cause of the maladjustment.

The Recent Testing Program

There is an almost total lack of factual evidence regarding audiometer tests previously administered or of the use to which the findings of these tests were put. There are no uniform reports of tests required by the Department of Education. In the Committee's efforts to evaluate the tests made by means of audiometers, in terms of a follow-up program other than the follow-up programs administered by means of W.P.A. projects, there was requested the pupil registration of the schools and the number of 4A audiometer tests given in each school. There was found to be wide variation between the pupil registration and the number of tests given. In addition, there was found to be no record of the tests in report form or on the pupils' permanent records. Although there had been some lip reading classes there was no information on the school records regarding such classes and no indication of knowledge that such classes existed. In fact, many school administrators indicated no knowledge of the existence of this service within their school. Apparently there has been little, and in the majority of instances, no follow-up by means of pitch tone testing, otological examination or treatment of those children whose hearing loss was found by

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

means of the group 4A audiometer tests. In other words in most instances where defects were found by means of a class screening there was no subsequent recheck and no effort made to remedy defects or to provide necessary follow-up services. Screening tests fail in their purpose when they are used only to discover hearing impairments. Such group screening tests should be followed by individual testing and otological examinations when the screening tests show the presence of a hearing loss. Other than the WPA projects, operating at the time of this study, there were found to be no means of providing for such necessary ear, nose and throat examinations. There are no otological examination or treatment procedures provided by the Board of Education or the Department of Health for acoustically handicapped children.

As a fundamental requisite diagnostic facilities are essential for the determination of individual decibel losses. Following such a determination, unless the procedure itself is to be nullified, it is necessary that each child requiring it receive a complete ear, nose and throat examination. This is necessary so that children may be selected

- (a.) for treatment of the pathological condition found
- (b.) for education in a regular class with lip reading adjustment
- (c.) for education in a regular class for special adjustment
- (d.) for education in a regular class with a hearing aid
- (e.) for education in a special school for the deaf
- (f.) for education in special classes for those with hearing loss for limited periods for the purpose of developing their hearing by means of hearing aids, and to correct speech defects by means of intensive speech training.

It should be emphasized that segregation is asocial and should be avoided whenever possible. Children should be selected for education in special schools for the deaf only when their

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

residual hearing is so little that their speech is markedly deficient or when there is no residual hearing. Emphasis should be laid preferably upon the residual hearing which should be trained by means of hearing aids, and on intensive training in speech correction. Children segregated in special schools for the deaf and in special classes for the hard of hearing should receive periodically a test of hearing ability with a hearing aid, and a test of advancement in speech correction in order that they may be returned to regular classes in the public schools when their progress is sufficient to promise the possibility of success in these classes.

Acoustically handicapped children should be considered in totality. It is illogical to isolate the medical and surgical problems of this group from the educational problems. A prevention of deafness and conservation of hearing program designed to meet the many and varied needs of acoustically handicapped children must include some educational recommendations by this Committee because medical and educational problems must be considered together in the development of an individual. If the aim of modern education is to prepare children for satisfactory, healthful living, society cannot afford to ignore the importance of any one of the many phases presented here.

All surveys including those made in England, the controlled study, the WPA and the Ciocco study, show that at least 3% of the school population have need of some one or several features of the program. In New York City, with a school registration of approximately 1,000,000 children, there are approximately 30,000 children who could be expected to benefit yearly by a program for the acoustically handicapped. It should be borne in mind that only $\frac{1}{3}$ or approximately 10,000 of the 30,000 children represent the estimated number who might require special educational consideration if a program for early detection, classification and follow-up were instituted.

SCOPE OF STUDY AND OTOLOGICAL FINDINGS

Present Equipment

Testing equipment was studied first as a basis upon which a program has to be built. There are 39 group- or phono-audiometers owned by the Board of Education which should be more generally utilized for screen testing. It also has 9 pitch range audiometers. These instruments are of various makes. Many are used less than two weeks in the school year and many were found to be in need of repair. Future purchases of audiometers should be restricted to instruments approved by the Council on Physical Therapy of the American Medical Association.

The Elementary School for the Deaf

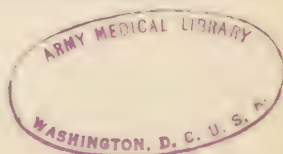
1. *Program Provided by the Board of Education For Acoustically Handicapped Children.*

WITH THE objective of ultimately suggesting a comprehensive and adequate program for children with impaired hearing, the Committee carried on an extensive study of the types of special education programs the New York City Board of Education has provided for this group of handicapped children. A preliminary survey revealed that very little was offered beyond the program given at P. S. 47, the City Day School for the Deaf. Accordingly it was decided first to examine this program. Fruitful conferences were held with Miss Margaret McCooey, Associate Superintendent, who has general supervision of the program of the Acoustically Handicapped in New York City; Miss Anna A. Short, Assistant Superintendent; Miss D. Frances Kauffman, Acting Principal of P. S. 47; Miss Harriet F. McLaughlin, who was at that time Assistant to the Principal. In addition, 20 experts in the education of the deaf and hard of hearing, including educators, social workers, and employment officers were invited to study the program offered at P. S. 47 and a Committee of Teachers of P. S. 47 also were invited to submit a short report including recommendations concerning this program.

A. *The Program of The Elementary School for the Deaf.*

1. *Administration*

P. S. 47, the City Day School for the Deaf, falls under the general supervision of the Associate Superintendent in charge of the Education of Handicapped Children. The school has been administered by an Acting Principal since the retirement of the former Principal in January 1936. The school therefore was without a permanently appointed principal for about four years though one has recently been appointed. This condition of un-



THE ELEMENTARY SCHOOL FOR THE DEAF

certainly has had an unwholesome influence on the whole school which was apparent to the Committee.

2. *The Building and Equipment*

In general the building, which was erected in 1925, is adequate as far as space is concerned, and provides 44 classrooms, 7 trade rooms and a cafeteria. Seven of the classrooms are too small for good classroom work, and the library is poorly located. On the 23rd Street side of the building, particularly, the noise is a very serious nerve strain factor for teacher and child alike, particularly for those children using hearing aids. Conditions of ventilation are satisfactory. An examination of the building from the standpoint of lighting indicates that there is a great deal of provision for natural illumination, each room having a great number of windows, which provides ample light on the window side of the classrooms, but does not provide enough natural light on the opposite side or inside classroom. The illumination in typical rooms on the south side of the building under these conditions, using only natural light, on horizontal reading situation. With the addition of artificial light in typical foot candles near the windows. Measurements on the vertical plane were very low at the blackboard and on the wall on the dark side of the room. These vertical readings are important in view of the fact that these are the conditions under which light would be brought to play on the teacher's face in a lip-reading situation. With the addition of artificial light in typical classrooms on the south side, the illumination was raised from 5 foot candles while the illumination near the windows remained the same, approximately 75 foot candles. However, it is necessary to keep the shades down during the mid-day, particularly on this side of the building, to eliminate disturbing direct sunlight. The rooms on the north side of the building vary from 1 to 3 foot candles on the dark side of the room to 30 to 40 foot candles near the windows using natural daylight only. The addition of artificial illumination increased this to approximately 6 foot candles on the dark side. There is a serious daylight glare reflection on the blackboard in many of the

THE ELEMENTARY SCHOOL FOR THE DEAF

rooms on the north side of the building which should be corrected by the installation of additional luminaires, double shades or venetian blinds. The classrooms should also be painted in colors that would have a higher correlation of reflection. Acoustically handicapped children need even better lighting conditions than hearing children in view of their greater dependence upon the visual medium.

3. Enrollment

According to the report of the Acting Principal submitted on Dec. 16, 1938 at the request of the Committee, the enrollment at that time was as follows:

(a.) On the basis of age group:

<i>Age</i>	<i>Boys</i>	<i>Girls</i>	<i>Total</i>
5	3	1	4
6 to 9	68	35	103
10 to 13	136	85	221
14 to 16	55	39	94
over 16	38	28	66
Total			488

(b.) On the basis of geographical distribution:

Manhattan	121*
Bronx	72
Queens	58
Brooklyn	232
Richmond	2
Pelham	2
New Jersey	1
Total	488

* The majority of these come from Northwest Manhattan.

(c.) On the basis of average hearing loss in the better ear and of the audiometric picture of the general location of greatest loss: (Audiograms were available for only 453 pupils).

	<i>Less than 20 db.</i>	<i>20 to 40 db.</i>	<i>41 to 60 db.</i>	<i>More than 60 db.</i>
Undetermined	2		25	107
Greatest loss in high frequencies	1	17	72	149
Greatest loss in low frequencies		2		11
Sharp drop in speech tone range (Frequencies of 512 to 2048)			18	49
	3	19	115	316

THE ELEMENTARY SCHOOL FOR THE DEAF

It is to be noted that 316 of the pupils, or approximately 70% of the school are in the group having a greater loss than 60 db., and that only 22 or less than 5% have as little loss of hearing as 40 db. or less. A rather large number, however, 115 pupils, or about 25% of the school, fall in the group having a hearing loss of more than 40 db. but less than 60 db. This is a higher percentage of children with this amount of hearing than is generally found in resident schools for the deaf, although it is about normal for day schools for the deaf. Two significant possibilities, however, present themselves in considering this large number of pupils with considerable residual hearing. The first is, if they are to be in attendance at the Special Day School for the Deaf, they should have continuous opportunity to use hearing aids. The second point is that without doubt many of those pupils now at P. S. 47 with this large amount of residual hearing, and certainly those with average or better than average intelligence, could undoubtedly have progressed very satisfactorily in the public school classes for the normally hearing, if the compensatory provisions suggested in programs 2, 3 or 4 as outlined in the section dealing with conclusions had been available. The provisions of programs 5 and 6 would have also made it possible for many children with more extensive hearing losses to have remained in the classes for normally hearing.

Two pupils were reported as being "on trial" and 2 below age were awaiting admission. In addition 41 names were recorded on a "suspense register." These pupils had been examined at the school, but were not admitted for various reasons, among which were the following:

Over 17 years of age.

Receiving treatment in private clinics.

Moved.

Receiving instruction at home through the Division for
Physically Handicapped Children.

Returned to district for investigation.

THE ELEMENTARY SCHOOL FOR THE DEAF

No record is available as to what ultimate disposition was made of their cases.

No records were kept as to the source of referral to the School of those pupils enrolled, but the large number had been referred by principals or teachers of normally hearing classes.

In addition to the above information on the enrollment at P. S. 47 the Committee obtained a report of 194 students referred to P. S. 47 between January 1935 and March 1938 by the Technical Director of the WPA Lip Reading Project. All children referred had a hearing loss greater than 35 db. and in the majority of cases had other difficulties that acted as contributing causes of maladjustment. The majority of these cases resided in Brooklyn, Bronx, and Queens.

The disposition of the cases reported was as follows:

Admitted to P.S. 47	60
Refused to attend P.S. 47, or failed to appear for examination	36
Hearing loss regarded as too slight	27
No transportation facilities	10
Awaiting examination	10
Moved or no record of disposition	51

4. *The School Day*

The school day at present is from 8:30 A.M. to 2:10 P.M. with 35 minutes for lunch at noon, at which time the majority of the pupils eat their lunch, under pleasant conditions, in the school cafeteria. Older pupils have prevocational shop work until 4 P.M.

5. *Transportation of Pupils*

A few pupils living in the neighborhood walk to and from school each day and a few additional ones travel by subway or elevated or public buses. The large majority, however, approximately 450, are transported daily to and from the school in 9 buses under contract with the Board of Education. A report submitted by the Superintendent of School Supplies on May 2,

THE ELEMENTARY SCHOOL FOR THE DEAF

1939, outlines the time of first pick-up and distance covered before reaching P. S. 47 for each bus as follows:

- Bus No. 99 Makes first stop at 2114 Glebe Ave., Bronx, at 7 A.M. and covers 20 miles before reaching P. S. 47.
- Bus No. 102 Makes first stop at 2279 Hill Ave., Bronx, at 7 A.M. and covers 22 miles before it reaches P. S. 47.
- Bus No. 119 Makes first stop at 2268 Hollers Ave., Bronx, at 7 A.M. and covers 23 miles before reaching P. S. 47.
- Bus No. 44 Makes first stop at 107-28 39th St., Ozone Park, at about 7 A.M. and covers 23 miles before reaching P. S. 47.
- Bus No. 37 Makes first stop at 163 Mulberry St., Manhattan, at 7:55 A.M. and covers 8 miles before reaching P. S. 47.
- Bus No. 58 Makes first stop at 36 Bevy Court, Brooklyn, at 7 A.M. and covers 22 miles before reaching P. S. 47.
- Bus No. 130 Makes first stop at 2829 West 1st Street, Brooklyn, at 7 A.M. and covers 22 miles before reaching P. S. 47.
- Bus No. 134 Makes first stop at 908 Avenue O, Brooklyn, at 7 A.M. and covers 21 miles before reaching P. S. 47.
- Bus No. 133 Makes first stop at 1314 46th Street, Brooklyn, at 7 A.M. and covers 21 miles before reaching P. S. 47.

The buses arrive at P. S. 47 at approximately 8:30 in the morning and leave again in the afternoon at 2:10 to return the pupils to their homes. It is to be noted here that an undetermined but large number of pupils must travel by bus for as long as 3 hours and for more than 40 miles each day going to and from school, some of them leaving their homes as early

at 7:00 A.M. and not reaching their homes again in the afternoon until after 4:00 P.M.

6. *Supervision*

The staff of P. S. 47 was reported to consist of 65 people, 46 being academic teachers, 7 being vocational teachers, the balance being members of the administrative staff. The full responsibility for the supervision of the entire program at P. S. 47, at the time of their study, fell upon the Principal and the Assistant to the Principal. A second position of Assistant to the Principal was provided in the Budget in February, 1937, but this position has not been filled, primarily because no examinations had been given for the position since the former Principal retired in January, 1936. Similarly, no examination was given for several years since that date for the purpose of selecting a Principal. Since this study was begun, however, a Principal has been appointed. The effective supervision in the school has been seriously affected in the past few years for a number of reasons. First, the present Principal has a tremendous load of administrative detail to attend to in connection with the affairs of a school with a register of about 500 pupils and a staff of 65 people. This precludes the responsibility of her being able to give sufficient supervision. The real burden of supervision must therefore fall upon the Assistant to the Principal who obviously cannot cover the supervisory needs of 50 classes in the academic department and 7 in the vocational department in addition to giving attention to the special supervisory problems of speech, lip-reading, acoustic training and teacher training. A supervisory staff of at least 4 people instead of the 2 now provided is necessary. The impossibility of the Principal and Assistant to the Principal meeting the supervisory needs of the school under present conditions is further indicated by the fact that of the forty-three P. S. 47 teachers who returned the questionnaires sent out to all teachers of the physically handicapped in May, 1939 as a part of the study, 14 out of 34 reported that they had had no individual conferences with the Acting Principal during the past year, and 19 out of 33 had had

THE ELEMENTARY SCHOOL FOR THE DEAF

no individual conferences with the Assistant to the Principal during the same period.

An additional weakness in the supervision of P. S. 47 which has always existed is due to the fact that the principal and assistants to the principal who are charged with the supervision of the highly specialized type of instruction that must be carried on in a school for the deaf have in the past been selected from the regular public school field. Although they are highly skilled in that field and were selected for the school for the deaf because of their skill as teachers, they have, nevertheless, had to acquire their technical knowledge of the deaf, which must be the basis for their supervisory guidance, entirely from contact or exposure to the problem supported only by scattered courses in the field. They have not acquired their technical knowledge from an intensive training program in the special field, and they have not had the opportunity for supervised observation and practice teaching, followed by actual teaching of classes of deaf children. This places these skillful supervisory teachers under a great handicap and inevitably restricts the value of the supervision they are able to render in the specialized field of the deaf.

7. Teacher Training Program

The teaching of acoustically handicapped children calls for a thorough knowledge of the highly specialized techniques involved. These can be required only as a result of at least a year's experience in a teacher training program that provides a full time carefully planned and closely supervised program of observation, practice teaching and lectures on theory. Previous teaching experience, or training to teach normally hearing children is very desirable, but it is the consensus of opinion of educators of the deaf and hard of hearing throughout the profession at large that this is subordinate in importance to the desirability of a thorough knowledge of the special techniques offered in a well-organized teacher-training program. The year's training should in every sense be a full year's training, and the teacher in training should accordingly be permitted the opportunity of

THE ELEMENTARY SCHOOL FOR THE DEAF

spending several hours each day observing experienced teachers on all levels. The practice teaching likewise should not be restricted to a permanent assignment for the whole year to one teacher who would then be responsible for all the training the individual would receive, nor should it consist of being prematurely and permanently assigned to take full charge of a class which would consequently make it necessary for the trainee to acquire the special techniques through direct and therefore bewildering contact with the problem.

The teacher-training program offered at P. S. 47 is inadequate for a number of reasons. The teachers assigned to P. S. 47 for training in the past have been selected from the regular public schools, have had teaching experience with the normally hearing and also have held the number one license. This background and experience is excellent, but, under present conditions when they move into the training program at P. S. 47 they are technically under the direction of the Acting Principal and Assistant to the Principal, neither of whom has the time adequately to supervise their growth. Consequently the responsibility for their training and supervision has been placed in the main with two classroom teachers who also teach a class all day. The training is not carefully organized in such a manner as to lead prospective teachers of the deaf through a program of observation and practice teaching supported by theory courses tying in closely with an organized practicum, and as a result the acquisition of techniques and skills essential in the field has of necessity been haphazard. The addition to the regular staff from year to year, therefore, of teachers whose training has been superficial, has thus had a cumulatively undesirable effect on the whole program of the school.

A survey of the training programs offered by three of the larger training centers for teachers of the deaf in the United States revealed among other things that:

- (a.) The average teacher training class in each varies from 6 to 12 per year.

THE ELEMENTARY SCHOOL FOR THE DEAF

- (b.) The courses of all three training centers extend for one full academic year 5 hours a day.
- (c.) The primary prerequisite for admission to all three schools is graduation from a four year accredited college or university.
- (d.) One training center reported an affiliation with a major university on the graduate level.
- (e.) The number of instructors engaged in carrying on the training of the student teachers in addition to those teachers who give demonstrations of classroom techniques was reported as 4, 5 and 8 respectively.
- (f.) The courses offered in the training program included:
 - Special General Methods of Teaching the Deaf.
 - The Teaching of Speech to the Deaf.
 - Acoustic Training and the Testing of Hearing.
 - Observation and Practice Teaching.
 - Eurythmics for the Deaf.
 - History of the Education of the Deaf.
 - The Teaching of Lip-Reading.
 - The Psychology of the Physically Handicapped.
 - The Study of the Auditory and Vocal Mechanism.
 - Problems in Educational, Mental, Social and Vocational Guidance for the Handicapped.

8. *Teachers' Preparation, Qualifications, In-Service Training and Eligibility Requirements for License.*

In May, 1939, a questionnaire was sent by the Board of Education to all New York City teachers of the Physically Handicapped asking for widely varied information. Of the 57 teachers at P. S. 47, 43 returned their questionnaires. In most of those returned, however, very incomplete information was submitted. On the basis of these 43 returned questionnaires the following information was secured:

- (a.) Educational Background and Training of Teachers
 - 25 are graduates of normal school
 - 16 have baccalaureate degrees

THE ELEMENTARY SCHOOL FOR THE DEAF

- 1 has a higher degree
- 28 have had elementary school teaching experience with the hearing child
 - 1 has had junior high school experience
 - 1 has had private school experience
- 15 have had experience in a resident school for the deaf
 - 2 have had experience in a private school for the deaf
 - 1 has had experience in a public school for the deaf other than P. S. 47
- 6 have had lip-reading teaching experience other than that in P. S. 47
- 10 are graduates of some teacher training center other than P. S. 47. (A number of these were trained under substitute teacher training conditions only)
- 16 received their training at P. S. 47
 - 9 acquired their training largely through scattered courses only
 - 7 have had very limited training
 - 1 has had no training
- 21 reported having been certified to teach the deaf by the Board of Education
- 24 reported having license No. 1
 - 4 reported having license to teach kindergarten
 - 1 reported having license to teach sewing
 - 1 reported having license to teach mentally retarded children
 - 1 reported having license to teach health education
 - 3 reported having substitute license to teach common branch subjects
 - 2 reported having licenses issued in other states
 - 8 recorded no licenses

THE ELEMENTARY SCHOOL FOR THE DEAF

- (b.) The most frequently recorded greatest problems facing the teachers were:
 - Speech and language difficulties of the pupils
 - The overcrowded curriculum
 - Social maladjustment problems of the pupils
- (c.) The most frequently expressed need in the way of additional courses for teachers in the field was that dealing with the use of hearing aids.
- (d.) The majority reported negatively on the value of alertness courses.
- (e.) The majority reported negatively regarding the value of group conferences with the school administrator, these being too largely confined to routine announcements.
- (f.) 29 reported that they had no opportunity to visit other schools for the deaf; 9 visits only were made to other schools during the past 2 years by all teachers reporting.

A review of the information concerning the teaching staff of P. S. 47 gathered through the medium of these questionnaires, as well as through personal individual conferences with the teachers and through the Teachers' Committee Report prepared for this Committee by a group of teachers in P. S. 47 reveals the fact that much of the obvious strength as well as the weaknesses of the program can be credited to the teaching staff. There are many excellent teachers of the deaf on the staff who through their sound training and years of experience are able to surmount the difficulties that accrue due to lack of guidance and supervision. There are, however, also many teachers on the staff who have had either very superficial training or no training at all. These latter most seriously show the lack of supervision and guidance and correspondingly contribute most to the deficiencies in the program that were reported by the visiting educators. In this group of teachers needing particular help are 12 substitute teachers of whom only 2 have had thorough training to teach the deaf.

THE ELEMENTARY SCHOOL FOR THE DEAF

The narrowing of educational perspective and inbreeding of thought at the school has been fostered throughout the years through the almost exclusive selection of teachers from the public school classes for the normally hearing who ultimately have been able to qualify for permanent appointment after very superficial training, and in addition through the limited opportunity that is offered for them to visit other effective programs in the country. This continuous inbreeding of thought, when coupled with ineffective technical preparation for the particular job of teaching the deaf as well as the absence of an alert in-service training program, has had a cumulative and enervating effect upon the work of the school as a whole.

The Department of Education must also assume a share of the responsibility for the ineffectiveness of the teaching staff. In the past, examinations for teachers of the deaf have usually been scheduled during a school term when it is almost impossible for highly trained, experienced teachers from other parts of the country, who would be interested in qualifying for these positions, to come to New York to take the examinations. Most serious of all, however, are certain provisions in the eligibility requirements which make it possible for candidates, by taking advantage of various substitutions, to establish themselves as eligible to teach the deaf without adequate training. The most illogical and harmful of these substitutions is that stated in the Eligibility Requirements as of October 1, 1938 under (c) III "Preparation," wherein it is stated that

"(c) In graduate or undergraduate courses, 6 semester hours in observation and supervised practice teaching (either in normal elementary school classes or in classes of the special type which the applicant desires to teach) 120 clock hours of such work will be accepted as equivalent to 6 semester hours.

Substitution: An applicant may offer an additional year of training in elementary and in Junior High Schools in lieu of the 6 semester hours in observation and supervised practice teaching."

THE ELEMENTARY SCHOOL FOR THE DEAF

With these alternatives available it is possible for a teacher of a regular public school class to qualify for a license to teach the deaf without ever having seen a deaf child being taught, inasmuch as he might offer one additional year of teaching in lieu of the 6 semester hours of required practicum, or if he has not had sufficient teaching experience to do that he could offer 6 semester hours of observation and supervised practice with normal children as an equivalent.

Observation and supervised practice teaching in a well organized and directed course of training is the most essential part of the whole training program for teachers of the deaf, for it is through this phase of the training that the prospective teacher acquires the complex skills and techniques necessary for successful teaching of the deaf. These techniques cannot be acquired through theory courses alone. Practicum experience with deaf children in an approved training program is absolutely essential.

9. *The Educational Program*

(A) *Academic*

At the request of the Committee, 9 experienced administrators, supervising teachers and teachers from the field of the education of the deaf and hard of hearing representing both large residence and large day schools for the deaf and service organizations for the hard of hearing spent two full school days visiting the classes and conferring with the Acting Principal, the Assistant to the Principal and the teachers.

Fifty academic classes were visited and each visitor submitted an independent report on his or her observations. The Acting Principal and Assistant to the Principal and all the teachers were most cooperative in giving all possible assistance and information requested, and in demonstrating teaching procedures.

1. General Atmosphere of the School

The general atmosphere of the school was cheerful and pleasant, with abundant evidence of careful consideration being given to the physical welfare of the pupils.

THE ELEMENTARY SCHOOL FOR THE DEAF

2. Grading and Size of Class

In as large a school as this it would seem that much more effective grading in the light of hearing loss, I. Q., achievement and age could be provided. Many classes were too large. A particular effort should be made to keep the average size of classes below 3A to less than 10 in number, with those classes below 2A being restricted to 8 pupils or less. There were 9 classes in the school with 11 pupils, 9 with 12 pupils, 4 with 13 pupils, and 1 with 14 pupils.

3. General Curriculum

P. S. 47 is an elementary school and provides an academic program from the kindergarten through 8B. According to the report of the Acting Principal during the first 4 years of the school program a specially graded curriculum is followed due to the primary need for pupils establishing in these first 4 years basic skills in language, speech and lip-reading. This would take them through class 2B. At that point, the curriculum parallels that of the regular school but contains special instruction in language until the 8B grade is reached.

It was the general consensus of opinion of the visitors that the curriculum in force at P. S. 47 needed revision and vitalizing, providing for the addition of much more opportunity for teaching in the light of modern educational trends. Here again the realistic fact must be faced that under present conditions neither the Principal nor Assistant to the Principal has had the time properly to inspire and coordinate such needed revision. The numerous reports of the Associate Superintendent, and the former Acting Principal of the school have also repeatedly called attention to this need for more administrative assistance.

The program contains too much restrictive and dull drill material with too little attention given to pupils'

THE ELEMENTARY SCHOOL FOR THE DEAF

interests. This was particularly evident in the teaching of language. The excessive attention given to the absorbing of subject matter through this drill medium rather than through a more extensive application of experience programs might be traced in part to too much effort to conform to the requirements of the regular public school syllabi which are followed closely above the 2B grade. Syllabi are still being followed which were prepared twenty years ago with but little revision. Procedures have changed a great deal since then. A more effective program for the utilization of residual hearing is needed. The use of the tactile sense and Eurythmics activities for speech development was not in evidence. There is also great need for a sound health education program throughout the school. The major part of this work is now carried on by the classroom teachers, many of whom have not had the training to do it effectively. Greater utilizations should be made in the academic classes of the shop experiences of the children. An increase in the amount of time permitted for speech, lip-reading and silent reading in the first 5 or 6 years of the school life of the children with a relative decrease in the required amount of written work in those years would undoubtedly result in much better speech and general language ability on the part of the pupils. Annual rather than semi-annual promotions as at present would be more economical, for proportionately much more can be achieved by the teacher who has a class of deaf children for a whole year than by one who must pass it on to another teacher after 5 months.

4. Lip-reading

The acquisition of lip-reading skill by children born deaf or who became deaf before useful speech and general language patterns had been established is accomplished by them in quite a different manner than by those who lose their hearing after language and speech have

THE ELEMENTARY SCHOOL FOR THE DEAF

been established or whose residual hearing was sufficient to permit them to acquire relatively extensive, although not completely normal, speech and language skills. The former usually are able to establish lip-reading skill almost entirely through early and repeated experience with language while progressing from single words to more complete expressions, whereas the latter because of their previously established complete language patterns established through the normal medium of the ear, should receive more formalized instruction in lip-reading. Adequate time and a definite course of study should be provided to carry those children rapidly and progressively forward in the achievement of this skill. The training should include sufficient practice in the mastery of thought content material as a whole and eye training and visualization of the basic movements. The subject should be taught either by a regular grade teacher who has had special training in methods of teaching lip-reading or by a lip-reading teacher.

The lip-reading of the pupils at P. S. 47 in general was fair. However, in the light of the large number who fall in the group having an average loss of less than 60 db. and also for the many pupils who lost their hearing after language had been established more formal lip-reading instruction should be provided.

5. Speech

The speech of the pupils of P. S. 47 compared with the speech found in other schools for the deaf must be regarded as only fair. It appeared that full advantage has not been taken of the presence of considerable residual hearing in many of the pupils as a means of establishing better speech. Even where those pupils were using hearing aids this advantage was not fully capitalized upon. In addition many of the newer concepts of speech teaching with the deaf, notably the use of the tactile sense, were not much used in establishing better

THE ELEMENTARY SCHOOL FOR THE DEAF

speech patterns. Here again it is pertinent to record the importance of keeping the size of classes below 3A, and particularly in the first 5 years of the school life of the child, to 8 or fewer pupils because the basic speech skills and voice quality of the deaf become fixed to a large extent during those first five years. Their speech after that point is largely vocabulary growth calling mainly for direction on the part of the teacher in the matter of correct pronunciation the first time new words are met. Naturally speech guidance never ceases with deaf and hard of hearing children, but the correction of speech deficiencies after the age of 12 when the patterns have been firmly fixed is uncertain indeed. Smaller classes, then, in these early years are essential. Essential, also, is the presence on the staff of P. S. 47 of a supervising teacher who is a skilled teacher of speech, knowing thoroughly the field of speech correction and development for both the normal hearing and the acoustically handicapped. The teaching of speech to acoustically handicapped children is the most complex activity in the program of a school for the deaf, and is the activity in which the average teacher of the deaf needs the assistance which can only be provided by one highly skilled in the articular techniques of teaching speech to the deaf.

6. Hearing Aids and the Use of Residual Hearing

Serving as it has for many years as the public school in the city system particularly created to absorb not only pupils who were born deaf but also those who because of hearing loss were gradually falling behind in their progress in the normal programs, P. S. 47 has always had a large number of children with considerable residual hearing. Prior to 1937, however, very little was done to take full advantage of this hearing educationally or for speech improvement through efficient group hearing aids. Only one group hearing aid was available for the whole school before that date. Quoting from

THE ELEMENTARY SCHOOL FOR THE DEAF

the Acting Principal's Report of December 16, 1938, "The school was backward in the matter of group hearing aids. Since 1937, nine have been granted to the school and six more will arrive shortly. This means an enlarged opportunity for training the residual hearing of many of the pupils. There is need for careful co-operative planning for and supervision of this work by an assistant to principal who will have sufficient time to do full justice to it." The effects of this neglect can be noted in the school today, particularly in the speech of those children having considerable hearing. Had they had the advantage of good hearing aids throughout their school years they would have undoubtedly been educationally less retarded and would have had much better speech than they now have.

However, in 1937, through the combined activity of the administrators and members of the staff of the Parent's Association, the needs of the school became more apparent and an Aurex hearing aid was provided, which, with the Radioear, provided the school with two group hearing aids. An instructor of physics in the Stuyvesant High School subsequently became interested in the problem and as a result made a study of equipment and prepared specifications for a group hearing aid to cost about \$200. A budget appropriation made possible the purchase and installation of 15 of those instruments.

In April of 1939 this Committee was asked for its views on this matter and a group of five technical and educational experts in the field of acoustics made a careful study of the hearing aid question, and the consensus of their views on the subject was:

- (a.) Whereas previously the question of the use of hearing aids had been too seriously neglected the sudden addition of 15 hearing aids of a single type was not desirable. It was sug-

THE ELEMENTARY SCHOOL FOR THE DEAF

gested that a more gradual introduction with accompanying provisions for training teachers in the proper use of the equipment would have been more advisable.

- (b.) That the plan ultimately to attempt to incorporate in the hearing aids provisions for selective amplification which would give to each the most ideal type of amplification in the light of his own particular hearing loss was commendable. This is a very complex problem which has been under study for some time by various noted physicists, and in the opinion of the Committee, could not be provided for the sum allowed for these instruments. A well-planned study to produce objective evidence of the effectiveness of the proposed 5 channel selective amplification is indicated.
- (c.) That more than one type of hearing aid installation should be included in the new equipment, particularly one employing the principle of providing a microphone for each child, so that more complete knowledge on the whole subject might be assembled after a period of several years of experimentation and study.

There are many pupils at P. S. 47, who, because of their high degree of residual hearing, can effectively use group hearing aids as a reliable and primary medium of communication supplementing and augmenting lip-reading to make their capacity to interpret spoken language through this combined seeing-hearing medium almost equal to that of normally hearing children. These children will be found in both the Academic and Vocational Departments, and good group hearing aids should be made available for the pupils of the latter

Department. The primary use of group hearing aids for the majority of the pupils, however, should be for the improvement of speech. Careful thought must be given, therefore, to the preparation of a well-planned program covering the use of these instruments which will point up clearly the objectives, possibilities, and limitations of hearing aids for any child in the light of the degree and type of hearing loss, and that will include for teachers a manual of activities that will enable them to reach these objectives with any given child. All children should be given experience with acoustic activities that will involve all speech sounds in their first 5 years of school regardless of what we may think their hearing capacity may be. We do not know enough about presence or absence of hearing in 5 or 6 year old children to decide at that age that one child should have the advantage of this experience and another should not. All children might profit by it and no child will suffer because of it if the activity is properly carried on. A competent supervisor for this phase of the program is definitely needed at P. S. 47, and it should logically be one who knows thoroughly the speech needs of the children, for speech growth and the utilization of residual hearing are inseparable.

7. Mentally Retarded Pupils

A number of mentally retarded acoustically handicapped pupils were found in a special ungraded class at P.S. 47. Several of these evidenced serious behavior disorders and were acute problems. Their mental and behavior deviations were primary handicaps and more significant than their loss of hearing. Efforts should be

THE ELEMENTARY SCHOOL FOR THE DEAF

made to determine the basis of their problems by the Bureau of Child Guidance. Some of these could probably be better cared for in an appropriate institution.

(B) *Vocational*

At the invitation of the Committee, eleven administrators and teachers widely experienced in the field of Vocational training and placement for both hearing and acoustically handicapped children visited P. S. 47 and studied the provocational training provided for the pupils. The greatest of courtesy was extended to them by the Acting Principal and Assistant to the Principal and by all the vocational teachers. Each member submitted a report of findings and these reports form the basis for the summarization of this phase of the school's program by the Committee.

Vocational training was introduced into the school in 1915, printing, cooking, and sewing being the fields in which training was offered. Apparently no difficulty was experienced in placing the graduates of the school in positions at that time, for according to the report to the Superintendent of Schools for 1918, 1919 and 1920 the demand for deaf workers was greater than the supply. Since then additional courses have been added until at present the school offers training in Printing, Woodworking, Art Metal, Lettering and Art for boys; and in Sewing, Art Homemaking, Art Metal Work and Industrial Design for girls.

The majority of the pupils are given an average of one forty-five minute period a week in the shops and usually spend the entire year in the same shop. Some older pupils, however, are given more instruction averaging at the most, however, only approximately 6 hours a week.

Since the school covers only the elementary grades, it has had to confine its shop work to a pre-vocational level. It is to be expected that in the face of the very limited training offered under that kind of program, together with existing general employment difficulties, the graduates of P. S. 47 in recent years have not found employment readily.

THE ELEMENTARY SCHOOL FOR THE DEAF

The training offered at P. S. 47 is pre-vocational in nature and therefore cannot be regarded as adequate preparation for employment. The teachers of the boys' activities are well grounded in their fields, but some of the teachers of the girls' activities are poorly equipped both by training and trade experience to teach shop practices. Shop teachers have not had extensive enough training and trade experience in their trade before appointment.

(C) *Personal and Vocational Adjustment*

The need for the determination of the abilities of pupils while they are still in P.S. 47 so that they may be intelligently directed into a school program where they are most likely to succeed, was obvious to all who visited the school, and in all their reports attention has been called by them to this. This need has also been recognized for some time by the acting principal, who has included mention of it in reports from time to time.

It was pointed out earlier in this section that the problem of placing the graduates of P. S. 47 prior to 1920 was comparatively simple. Since 1929, however, the problem of placement has become more acute, for competitively the acoustically handicapped worker has been given an added handicap by virtue of the fact that vocational training opportunities for normally hearing boys and girls have increased rapidly in the past ten years, while the programs offered in schools for the deaf, which were formerly the leaders in this field, have remained until very recently, somewhat static. This is particularly true of the vocational training program at P. S. 47 which has continued, since its inception in 1915, to be purely pre-vocational in nature. The semi-trained graduates of P. S. 47, therefore, are continuously in competition for jobs with well trained normally hearing boys and girls who have received their training in the vocational high schools and trade schools of the City.

The practice, therefore, prior to 1929 of referring pupils automatically to city high schools or vocational schools for hear-

THE ELEMENTARY SCHOOL FOR THE DEAF

ing pupils without consideration for the pupils' needs or without a follow-up check as to the success or failure in the program, is no longer effective. Until very recently it was apparently assumed by many of those connected with the school that all these graduates who went on to high schools and vocational schools for hearing pupils were experiencing universal success and excellent adjustment in those surroundings. Much publicity has been given in annual reports from time to time as to the large numbers that have been thus directed to those secondary programs.

Apparently, however, the question has not been frequently asked as to whether or not they had been logically directed in the light of their needs and capacities for possible success, nor was there a real understanding or investigation of what advantages or disadvantages a public school for hearing might have as compared, let us say, with the vocational training program a residential school for deaf might be able to offer. There was, apparently, a lack of understanding of the function of the latter as indicated in the following excerpts:

From Acting Principal's reply of June 4, 1937, to Dr. Campbell's questionnaire:

"Mentally defective cases are referred to residential schools as no provision is made for admission to P. S. 47, which uses the oral method of instruction."

"Very average or older dull pupils are encouraged to go to residential schools for the deaf which specialize in vocational training of a more advanced nature than that given in P. S. 47."

These statements apparently seemed to imply that the problem of the mentally defective deaf does not touch the City. This implication seems to be supported by the fact that at least 100 sub-normal acoustically handicapped children who have not adequately been cared for have come to the attention of the Committee. From a guidance point of view, also, this attitude seemed to imply that only the average or slow deaf need the

THE ELEMENTARY SCHOOL FOR THE DEAF

advantage of sound vocational training. This lack of understanding or failure to consider the greatest needs of the child has led to the continuance of the general practice of referring the graduates of the school to the already overcrowded city high and vocational schools for hearing pupils and away from the newly created state supervised vocational training programs available in residential schools for the deaf where their chances of success are better because of smaller classes and better knowledge of the problem. As a consequence there has been a very serious history of maladjustment and failure on the part of those graduates so referred. The majority have failed to complete the courses they entered and were compelled to seek more effective adjustment in the vocational training programs offered at the residential schools. The most serious results of this lack of good guidance and follow-up were the time lost by the pupils together with the undesirable psychological effect of having experienced needless failure.

To determine further, therefore, what success the graduates of P. S. 47 had been experiencing in the field of employment with the P. S. 47 vocational training as a background, or in the city high schools and vocational schools for hearing pupils to which they had been referred, a follow-up study was made, under the direction of the Committee, of all the graduates of P. S. 47 for the 10 years from 1929 to 1939. Questionnaires were sent to 360 former pupils and in addition personal interviews were arranged with many of these graduates. Information was obtained from 182 of the 360 and may be summarized as follows:

1. The average age at graduation was 16 to 17.
2. The age range at time survey was made was 15 to 29.
3. The large majority were satisfied with the academic training received at P. S. 47 but regarded the vocational training as inadequate.
4. In answer to the question of how long they attended school after leaving P. S. 47 the following information was gathered.

THE ELEMENTARY SCHOOL FOR THE DEAF

Did not continue school elsewhere		<i>Percent</i>
		10
Went to Academic School		
Less than 1 year	4%	
1 year	5%	
2 years	10%	
3 years	6%	
4 years	5%	30
Attended Vocational School		
Less than 1 year	10%	
1 year	21%	
2 years	19%	
3 years	8%	
4 years	2%	60
		<hr/> 100

5. The first position was obtained on an average 2 years after leaving school and was obtained through

		<i>Percent</i>
A Friend	14%	
The School	15%	
An Employment Agency	17%	
By Self	17%	
Through Family	36%	
Through a Social Agency	1%	100

6. The length of time the position was kept

		<i>Percent</i>
Less than 6 months	40%	
6 mos. to 1 year	20%	
1 to 2 years	15%	
2 to 5 years	20%	
More than 5 years	5%	100

7. Percentage of pupils securing positions after leaving school

		<i>Percent</i>
Continuing Education	17%	
No position	19%	
One position	27%	
Two positions	19%	
Three positions	12%	
Four positions	4%	
Five positions	2%	100

8. In answer to question "Are you now working?" 22 people replied "Yes" and 72 replied "No."

THE ELEMENTARY SCHOOL FOR THE DEAF

The need for real vocational training for P.S. 47 graduates is also indicated in the figures submitted by the Special Employment Officer for the Deaf in the New York State Employment Service. The number of P.S. 47 graduates registered in the employment service in 1939 was 145, and of this number in the last 2 years, 70 were sent to resident schools for the deaf for further vocational training 36 of these were boys and were sent to the New York School for the Deaf. Of these 36, 7 had worked and 29 had never had a position. Thirty-four were girls and were sent to the Lexington School for the Deaf for further vocational training. Of these 34, 18 had worked and 16 had never been employed.

This supports the view that more vocational training should be provided for P.S. 47 pupils and that proper direction might have protected many of these graduates from the undesirable drifting from school to school and job to job so many of them experienced after leaving P.S. 47.

This guidance program should include the services of a trained social worker or visiting teacher who should be able to render much needed help in general guidance. She should also be charged with the responsibility of directing a strong program of parent education. Many of the guidance problems pertaining to pupils cannot be worked out without cooperation of the parents. Such parent contacts should be established not only while the child is in school, but also before he enters and after he graduates. The social worker now technically assigned to P.S. 47 is not rendering any real guidance and follow-up service.

B. Educational Services Provided in Addition to P. S. 47

Very little has been done throughout the years in the way of compensatory programs for acoustically handicapped children attending classes for normally hearing children in the Public Schools of New York City. Outside of the extensive program in lip-reading instruction carried on under the WPA Lip-Reading

THE ELEMENTARY SCHOOL FOR THE DEAF

Project, most of the attempts to provide these compensatory programs have been carried on by organizations not officially connected with the Board of Education. These unofficial programs which have been provided for New York City pupils consisted of

1. Saturday morning classes in the Demonstration School of the New York League for the Hard of Hearing. Instruction in lip-reading, speech correction and remedial work has been carried on at the League headquarters for a number of years on Saturday mornings and as often during the week as possible, for as many acoustically handicapped children as could be accommodated. During the school year of 1937-38, 120 pupils, who were attending classes for the normally hearing children, attended the Saturday morning classes at the League.

2. A special Summer Class for hard of hearing pupils was conducted at the Lexington School for the Deaf for six weeks for the past three summers, under the auspices of the State Education Department.

The compensatory programs in addition to P.S. 47 that have been officially provided by the Board of Education or cooperating New York City Departments have consisted of:

- (a) A few scattered classes in lip-reading carried on in schools for the normally hearing children. These have been established largely through the energy and foresight of the Associate Superintendent in charge of the education of the handicapped and one Assistant Superintendent in the Bronx, and another in Brooklyn, some school Principals of certain schools, and through the cooperation of teachers qualified to teach the subject. Over a long period of years only a few of these classes have been in continuous existence.
- (b) Speech correction provided by the teachers of speech improvement. As a part of their routine work, the

THE ELEMENTARY SCHOOL FOR THE DEAF

teachers of speech improvement have come in contact with certain cases of defective speech due to loss of hearing and have given correction accordingly. However, this service has been limited due primarily to the fact that this department is under-staffed and cannot possibly cover all normally hearing children with speech defects, not to speak of those children with hearing defects who have accompanying speech defects. During the school year 1938-39, only 298 acoustically handicapped children in all Boroughs were given speech correction through this department.

- (c) The Child Guidance Bureau has from time to time referred children to P.S. 47 that have come to their attention as having impaired hearing. There has been no consistent policy, however, governing these referrals, nor has there been any follow-up made by this or other departments regarding these referrals. Many of the cases that have been referred to P. S. 47 by this division were not admitted to the school for various reasons in spite of the fact that their case histories showed severe enough impaired hearing to warrant their admission.
- (d) A WPA Lip-reading project has been in force since 1935, and a large number of acoustically handicapped children in the regular public schools have been given lip-reading instruction regularly. The program started with a staff of 125 lip-reading teachers. This later was reduced to 42 teachers. In April, 1939, however, all but three of the teachers were dropped under the 18 months WPA rule. The 42 teachers were covering 119 elementary and 10 secondary schools and were giving instruction to 3,085 pupils, with 2,831 additional pupils awaiting assignment. The Committee ascertained from the March 1940 report of the WPA Lip-reading Teaching Project that the lip-reading teach-

THE ELEMENTARY SCHOOL FOR THE DEAF

ing service in the schools since November 1939 was conducted as follows:

Number of teachers	19
Number of children under instruction	1,409
Number of schools in which lip-reading instruction is given	110
Maximum number under instruction per year	6,429
Maximum number awaiting instruction	7,230

The conditions under which this instruction was given were most undesirable, the teachers frequently having to give their instruction in dark corners, cloakrooms, noisy lunchrooms, etc. In spite of these unpleasant circumstances much good was accomplished and the discontinuance of the program has left practically nothing in the way of a remedial program for those acoustically handicapped children attending the New York City public schools for the normally hearing.

On the basis of all that has been ascertained from questionnaires from school Principals and on the basis of personal observations of numerous observers, therefore, it is obvious that the compensatory programs available for acoustically handicapped children, who attend classes for the normally hearing in the New York City Public Schools are inadequate to meet the needs of the thousands of acoustically handicapped pupils who are definitely in need of some assistance. This compensatory help does not necessarily have to mean attendance at P.S. 47 or any other special program similar to that. It may only call for provision of hearing aids, or special tutoring service, or it may call for the establishment of special remedial classes within regular schools for normally hearing children.

As the result of the testing program which shows the prevalence of hearing loss among the public school children, the need is shown for the establishment of an adequate program to meet the varied needs of all pupils in the schools at the present time who have hearing losses serious enough to retard their educational progress.

II. *Study of Selected Public School Acoustically Handicapped Pupils.*

A. *Speech Study*

411 public school acoustically handicapped pupils attending the regular public school classes were selected for examination in order to ascertain to what extent and in what manner acoustically handicapped children deviate in speech ability from the average for children with normal hearing. The study was not very closely controlled and was quite subjective in nature, but it did nevertheless reveal the following:

The majority of the cases selected had relatively slight losses of hearing. This is to be regretted, although it is not as serious a factor as it might seem on the surface, for in the final analysis cases with slight losses are more or less borderline cases as far as speech disorders are concerned in the light of hearing loss, and definite implications as to the influence of slight losses of hearing or speech are very valuable. More severe hearing losses are, of course, inevitably accompanied by obvious and extensive speech deficiency and are readily recognized.

301 of the cases had average hearing losses of not over 20 decibels; 74 had losses between 20 and 40 decibels; 34 had losses between 40 and 60 decibels and only 2 had losses greater than 60 decibels. The most significant factors in connection with the study in regard to the degree of loss were that speech deviations from the normal were not marked generally in those cases which had an average hearing loss of less than 40 decibels, and that slight hearing losses of 20 decibels or less had no noticeable effect on speech proficiency. Not until the average loss approached the 60 decibel average did the speech of the pupil become deficient. This does not apply, of course, to children born with an average loss as great as 60 decibels. The type of loss, naturally, has its relative influence on the speech proficiency, middle ear deafness commonly inducing subdued

THE ELEMENTARY SCHOOL FOR THE DEAF

volume, with inner ear deafness generally inducing over-loudness of volume.

Thus it is obvious that the presence of a known hearing loss does not necessarily carry with it the positive need for speech correction. The degree and type of loss will strongly influence that need. Generally speaking, children with average losses of 20 decibels or less in the better ear will not need any speech correction service beyond that indicated for hearing children.

More speech teachers are needed, however, to meet the needs of the many acoustically handicapped children now in attendance in the regular public schools with losses greater than 20 decibels. These teachers should be a part of the Speech Improvement Department but should be given special courses dealing with the particular speech problems of acoustically handicapped children.

B. Implications of Psychological and Speech Tests Administered to Selected Groups of Normally Hearing and Acoustically Handicapped Children.

The results of psychological tests administered to 287 acoustically handicapped pupils, who were attending the public school classes for the normally hearing were compared with the results of tests obtained from tests administered to 282 normally hearing children. This comparison revealed that acoustically handicapped pupils attending public schools for the normally hearing, who have average losses in the speech range of not over 20 db., have no serious educational problems as far as achievement is concerned, but that as the average losses increase beyond this 20 db. point, the educational difficulties and corresponding retardation increase.

C. Psychological Testing of Children in Grades V to VIII of P. S. 47.

For the purpose of learning still more, and from a different approach, to the problems surrounding the education of the

THE ELEMENTARY SCHOOL FOR THE DEAF

acoustically handicapped child, a series of psychological tests were administered at P.S. 47.

Pintner-Non-Language tests were administered to 140 pupils in Grades V to VIII inclusive; New Stanford Achievement tests were administered to about the same number in these same grades, and personality tests consisting of Pupil Portrait tests and Aspects of Personality tests were given to 110 older pupils in these upper four grades.

Briefly the results of these tests show that of the 140 pupils in Grades V to VIII inclusive that were given the Pintner-Non-Language intelligence test the range of I.Q. was 60 to 147 and the median I.Q. was 105.2. This median of 105.2 is regarded as high when compared with the median of 90 for schools for the deaf in general, which was established in 1924 on the basis of earlier forms of this test and appears to indicate a selective factor at work in the pupil personnel. The pupils in the school, therefore, should logically reach a higher level of achievement than in the average school for the deaf.

That this higher achievement is being experienced is indicated by the fact that the average I.Q. of the school is 80, which is higher than the average of all schools for the deaf, which was determined to be somewhere in the 60's in the national survey of schools for the deaf in 1924. The results of the 1924 and the 1938 tests may be not strictly comparable because of time elapsed and variations in techniques and in test forms. Table IV

TABLE IV

Educational Quotients of Pupils in P.S. 47 as Based on Results
Secured with New Stanford Achievement Test
(Spelling, Physiology and Hygiene Sections of Test Omitted)

	GRADES				<i>All Grades Combined</i>
	V	VI	VII	VIII	
Number of Cases	37	35	44	24	140
Median	75.6	81.3	80.5	83.8	80.5
Q1	67.3	76.3	75.0	79.5	74.8
Q3	81.4	89.6	92.5	90.5	89.5

THE ELEMENTARY SCHOOL FOR THE DEAF

presents the median I.Q. for each grade separately and for all grades combined, together with first and third quartile points for the distributions of educational quotients.

The results of the achievement tests given the pupils in the fifth to eighth grades inclusive show that the pupils are three to four years retarded. These results are similar to those found in previous achievement surveys of schools for the deaf. In terms of grade scores each of the four grades received a median score of about one grade below the grade assigned or designated. This is no criticism of the school. It may well be sound educational policy in view of the chronological ages of the children concerned and in view of the handicap in language from which they suffer.

Median educational ages and grade equivalents secured on the Stanford Achievement Test, together with median chronological ages for each grade group are presented in Table V.

The Aspects of Personality tests administered to 110 older pupils revealed that:

1. In Ascendence-Submission the deaf children tested tended to respond in a somewhat more dominant manner than normally hearing children.
2. In Extroversion-Introversion the median score is very similar to that for hearing pupils, with acoustically handicapped boys being somewhat more extrovert than acoustically handicapped girls.
3. With respect to Emotionality, the deaf children differed markedly from hearing children in average score. The median percentile ranks for boys was 18 and that for girls was 16, indicating a lack of adjustment or emotional stability on the part of these deaf children. To what extent the scores obtained represent a true measure of their emotional condition and to what extent they are vitiated by language difficulty or other factors, it is impossible to say.

THE ELEMENTARY SCHOOL FOR THE DEAF

TABLE V

Standing of Pupils in P. S. 47 According to Results
on the New Stanford Achievement Test.

Tests	V	Grades		
		VI	VII	VIII
Number of Pupils	37	35	44	24
Median Chronological Age	14-2	14-10	15-7	17-0
Total Test*				
Median Educational Age	10-4	11-7	11-9	12-7
Median Trade Equivalent	4.4	5.7	5.9	6.8
Paragraph Meaning				
Median Educational Age	9-10	10-11	11-0	11-6
Median Trade Equivalent	4.0	5.0	5.1	5.7
Word Meaning				
Median Educational Age	10-1	10-8	11-1	11-7
Median Trade Equivalent	4.2	4.7	5.2	5.7
Arithmetic Reasoning				
Median Educational Age	10-0	11-4	11-0	11-10
Median Trade Equivalent	4.1	5.5	5.1	6.0
Arithmetic Computation				
Median Educational Age	10-10	12-7	13-3	14-1
Median Trade Equivalent	4.9	6.8	7.5	8.2
Language Usage				
Median Educational Age	10-5	12-3	12-11	15-0
Median Trade Equivalent	4.4	6.4	7.2	9.0
Literature				
Median Educational Age	10-6	10-8	11-10	12-3
Median Trade Equivalent	4.5	4.7	6.0	6.4
History and Civics				
Median Educational Age	10-2	12-10	13-5	13-9
Median Trade Equivalent	4.3	7.1	7.6	7.9
Geography				
Median Educational Age	10-6	12-2	12-7	12-10
Median Trade Equivalent	4.6	6.3	6.8	7.1

* Except Dictation (Spelling), Physiology and Hygiene Sub-Tests.

The correlations between amount of hearing loss and the three traits for 110 cases are as follows:

Ascendence-Submission $r = -.10$

Extroversion-Introversion $r = -.02$

Emotional Stability $r = -.14$

Evidently there is no relationship between scores on these

THE ELEMENTARY SCHOOL FOR THE DEAF

three traits and amount of hearing loss within this group composed of children all having serious acoustic handicaps.

The Pupil Portrait tests attempt to measure the general adjustment of the child in school and home. In this test low median percentile scores were found for both boys and girls, pointing to lack of adjustment, provided the children understood thoroughly the language of the test. The correlation of Pupil Portrait percentile score with amount of hearing loss is + (plus) 61 for 106 useable cases, showing a definite trend, according to this test, for those with greater amounts of hearing loss to feel better adjusted. Score in relation to age of becoming deaf shows a slight tendency for those who become deaf later in life to feel better adjusted.

D. Educational and Psychological Tests given to Matched Groups of Normal and Hard of Hearing Children in the Public Schools of New York City.

A series of educational and psychological tests were administered to 287 hard of hearing pupils and 282 normally hearing pupils matched as nearly as possible as to age, grade and sex and selected from the same classrooms. The criterion of acoustic handicap employed was a loss of 9 decibels or more in either ear as indicated by two tests on the 4A audiometer. Further measures of hearing ability were secured by testing with a pitch range audiometer.

The tests used in this study consisted of the New Stanford Achievement Test, Form V, the Pintner General Ability Test, Form A, and the Pintner Aspects of Personality and Pintner Pupil Portrait tests. Table VI presents the main facts regarding age, achievement and intelligence of the two groups. The groups are closely matched in chronological age and are similarly distributed by grade. In reading and in general achievement the differences between medians for the normally hearing and for the hard of hearing are small and while they are in favor of the normal hearing pupils the obtained differences are not statistically significant. With regard to intelligence, however, a

THE ELEMENTARY SCHOOL FOR THE DEAF

different situation holds. In grades 4A, 5A, 5B and 7A the median I. Q.'s of the normal hearing groups are considerably greater than those for the acoustically handicapped groups, the different situation holds. In grades 4A, 5A, 5B and 7A the median I. Q.'s of the normal hearing groups are considerably greater than those for the acoustically handicapped groups, the differences being 10.6, 4.2, 7.5 and 10.9 points respectively. In only one grade does the handicapped group show a higher median I. Q. than the normal group and there the difference is less than two points.

TABLE VI

Number of Cases, Median Chronological Age, Median Reading Grade Average, Median Achievement Grade and Median Intelligence Quotients of Normal Hearing and Hard of Hearing Matched Groups, by Grade.

Number of Cases			Median Chrono-		Median Average		Median Average		Median I.Q.	
Final Groups			logical Age		Reading Grade		Total Achieve-			
<i>Hard of</i>			<i>Hard of</i>		<i>Hard of</i>		<i>Hard of</i>		<i>Hard of</i>	
<i>Normal</i>	<i>Hearing</i>		<i>Normal</i>	<i>Hearing</i>	<i>Normal</i>	<i>Hearing</i>	<i>Normal</i>	<i>Hearing</i>	<i>Normal</i>	<i>Hearing</i>
4A	13	14	9-5	9-6	4.2	3.8	4.0	3.9	93.1	82.5
4B	63	63	9-10	9-10	4.6	4.6	4.3	4.3	98.2	98.3
5A	45	48	10-8	10-10	4.9	4.6	4.4	4.4	92.5	88.3
5B	46	46	10-11	10-11	5.7	5.5	5.2	5.0	95.4	87.9
6A	29	33	11-6	11-8	6.2	6.1	5.7	5.3	93.5	91.0
6B	39	39	12-0	11-11	6.0	6.0	6.0	6.0	93.0	94.4
7A	26	23	12-5	12-9	7.1	7.1	7.1	6.8	99.2	88.3
7B	21	21	13-1	13-0	6.7	6.2	6.7	6.2	89.2	88.8

In the personality tests, the hard of hearing group did not deviate from the norms with respect to Ascendance-Submission or Extroversion-Introversion but in Emotional Stability the median of the group deviated markedly from the norm in the direction of lack of adjustment.

To determine the relationship between degree of acoustic handicap and such factors as achievement and measured intelligence, the hard of hearing group was classified according to the

THE ELEMENTARY SCHOOL FOR THE DEAF

categories of deafness established by Ciocco.* The principal comparisons are between the more seriously deafened cases and Group I cases, described by Ciocco as having "Good hearing for all tones. All tones are heard at an intensity equal to or less than 20 decibels." It should be recalled that all "hard of hearing" cases were so designated on the basis of two 4A audiometer tests which showed them to have 9 db. or greater loss in one or both ears. Sixty-three and one-half percent of the hard of hearing group were assigned to Ciocco's Group I classification on the basis of their 2A record.

Analysis of average scores indicates that acoustically handicapped pupils attending public schools for the normally hearing, who have averaged hearing losses in the speech range of not over 20 db. have no serious educational problems as far as achievement is concerned. In intelligence audiogram, Group I resembles the normal hearing group, rather than the more severely handicapped groups.

Both achievement and intelligence are definitely related to degree of hearing impairment and the evidence is clear that children with serious hearing impairments are penalized in the regular classroom.

* Ciocco, A. Audiometric Studies on School Children, II. U.S. Public Health Reprint No. 1784.

Summary of Findings and Conclusions

A. Findings

I. Prevalence of Hearing Impairment

Results of all studies conducted under the direction of the Committee together with recent studies made available to the Committee revealed the fact that the prevalence of hearing impairment among New York City public school children on the basis of the 4A audiometer tests is approximately 4%. On this basis, therefore, it would appear that more than 30,000 New York City public school children from the elementary level through the secondary level have a hearing impairment of at least 9 decibels loss or more in both ears. The great majority of these children will be found in the elementary schools, for it was discovered through this extensive testing program that the prevalence of hearing loss was much smaller in the upper classes. This was particularly marked at the high school level and probably points to the operation of the selective factor of struggle for educational survival under unfavorable circumstances which resulted in the elimination of many acoustically handicapped children in the upper grades. This elimination in the upper grades may also be caused in part by the progressive nature of the hearing impairment which may reveal itself in adolescence as an increasingly handicapping factor.

The Committee expects that as a result of the comprehensive testing program it will now be possible not only to establish the prevalence of hearing loss among school children, but also to group those with losses into four different classes on the basis of degree of loss, with the hope that the method of classifying on the basis of degree of loss will clarify the general scope of the educational program necessary to serve all acoustically handi-

SUMMARY OF FINDINGS AND CONCLUSIONS

capped children in the community. These four classifications on the basis of degree of loss were as follows:

- Not over 20 db. loss in the better ear
- Between 20 - 40 db. loss in the better ear
- Between 40 - 60 db. loss in the better ear
- More than 60 db. loss in the better ear

On the basis of the statistical studies carried on by the Committee and also on the basis of previous recent studies made available to the Committee, it has been estimated that of the more than 30,000 acoustically handicapped children now in the public schools of all the boroughs of New York City, 63% or approximately 20,000 of these have a hearing loss of not over 20 db. in the better ear, that 25% or approximately 7,500 have losses of between 20-40 db. in the better ear; that 11% or approximately 3,300 have losses of 40 to 60 db. in the better ear; and that less than 1% have losses of more than 60 db. in the better ear.

II. Procedure, Provisions and Facilities for Testing and Follow-up

The Committee found a well organized and comprehensive testing program in operation under the Division of Health Education of the Board of Education in cooperation with the WPA. However, there seems to be no plan for conducting the tests on an annual, semi-annual or other fixed schedule throughout the school system. Some schools were tested as often as three times within one school year while others were not tested in a period of five years. However, an extensive program has been organized and is in operation in 21 of the City's 54 school districts. Certain schools in these districts have been tested while others in the same districts have not been tested. This points to the need for a systematic program of testing. It was further ascertained through questionnaires returned by administrators that much equipment is available for conducting such a program. There are 39 group or phonograph audiometers owned by the Board of Education or individual schools which

SUMMARY OF FINDINGS AND CONCLUSIONS

are available for group testing. The Board of Education also owns four 2A and one 6A pitch range audiometers and has at its disposal two 2A audiometers owned by the WPA. Much of the equipment owned by the Board of Education is not being utilized to any appreciable extent. The Committee further found that some of this equipment is in poor condition, some is not standard, and much of it is used as little as two weeks during the school year. In many schools, there were no records kept of the hearing tests made.

Individual retests by pitch range audiometers are administered under the direction of the Assistant Director of Health Education, largely in the districts and schools where group tests have been administered with a view to finding the children for the compensatory educational program offered by the WPA. Follow-up is largely a hit or miss procedure. In a majority of the schools there is no attempt at follow-up while in others, it is undertaken by the principals, health teachers or school nurses who refer children to clinics, social agencies or to Public School No. 47 for medical service.

Provisions are made on health record cards for the recording of pitch range audiometer findings, but very few schools record such findings or any other information pertaining to the hearing of the children.

It would appear, therefore, that there is sufficient *group* testing equipment to carry on an effective 4A screening test; that, there is need for more pitch range audiometers for *individual* testing of all cases discovered in the screening test as having a hearing loss of 9 dbs. or more; that, there is an obvious need for a systematic and coordinated testing program, with responsibility designated regarding the purchase, use and upkeep of equipment.

III. *Otological and Medical Care*

When the Committee started its study, it found five otologists making examinations as part of a WPA Project. This

SUMMARY OF FINDINGS AND CONCLUSIONS

service was discontinued in the Spring of 1939. Insofar as the Committee can ascertain, there is now no medical or otological service for acoustically handicapped children either under the Board of Education or Department of Health other than the service provided in Public School No. 47.

IV. *Appraisal of Educational Programs Provided by the Board of Education*

The Committee found that the only official educational program provided by the Board of Education for Children with hearing losses was that given at P.S. 47, the city day school for the deaf. A study of this school revealed the following:

1. The Building

While the school is centrally located from the standpoint of serving all boroughs, it does not constitute an ideal provision for meeting the needs of all acoustically handicapped children of all boroughs. The building is spacious and modern, but the lighting conditions are unsatisfactory in many rooms.

2. Enrollment

Approximately 500 pupils are enrolled in the school, about one-half of these residing in Brooklyn and one-third in Manhattan. Approximately 35% of the pupils have less than a 60 db. loss in the better ear. Thus the presence in school of a large number of pupils with considerable residual hearing for speech presents an excellent opportunity for the use of hearing aids.

3. The School Day

The school has been operating from 8:30 in the morning through 2:10 in the afternoon with some of the older pupils continuing in prevocational work until 4:00 P.M.

4. Transportation

Approximately 90% of the pupils are transported daily to and from the school by 9 buses. The route

SUMMARY OF FINDINGS AND CONCLUSIONS

covered by these buses, both in going to and coming from the school, varies from 20 to 30 miles. In many cases the first pick-ups are made in the morning as early as 7:00 o'clock and it was reported that many pupils must arise as early as 5:30 in the morning to catch the bus.

5. Supervision

P.S. 47 is administered by a principal with the assistance of an Assistant to the Principal. The full responsibility for the supervision of the program in all its phases falls upon these two people. Because of the heavy administrative loads that must be carried by the Principal and the Assistant to the Principal, insufficient time remains for adequate supervision of the teachers, both academic and vocational. Accordingly the whole program has suffered because of a lack of adequate supervision. At least two additional supervisors are needed.

6. The Teaching Staff

There are many excellent teachers in P.S. 47. There are, however, also a number of teachers on the staff who have had either no training to teach in this special field or who have had superficial training. Numbered among these teachers are 12 substitutes, only 2 of whom have had training in the teaching of the deaf. Thus the presence on the staff of this number of poorly qualified teachers has had an undesirable effect on the program.

7. Teacher Training and Teacher Qualifications

The teacher training program as it is now offered at P.S. 47 is not well organized, or carefully supervised. It is superficial and inadequate for preparing teachers for this highly specialized field. Much of the ineffectiveness of the program can be charged to the lack of time and facilities for supervisory assistance in the school.

SUMMARY OF FINDINGS AND CONCLUSIONS

The requirements for the licensing of teachers of the acoustically handicapped as prescribed by the Board of Education up to this time has made it possible for experienced teachers of the normally hearing to substitute either an additional year of teaching with the normally hearing or six hours of practice teaching with normally hearing children in lieu of the required six hours of practice teaching with acoustically handicapped children that are required. This has made it possible for many teachers to be licensed to teach the acoustically handicapped without having had adequate training and experience in this field. There are a number of teachers at P.S. 47 who have been licensed to teach at this school under the terms of these substitutions and this has in turn reduced the general effectiveness of the program.

8. The Academic Curriculum

The academic curriculum of the school is out-moded in many respects and fails to meet the special needs of these pupils as it does not provide sufficiently for their individual differences. Recognition has not been given to the changes that have been taking place in the approach to the education of the deaf in many of the progressive schools throughout the country. In particular little advantage has been taken of the presence of appreciable degrees of residual hearing in a large number of pupils. This neglect has been somewhat corrected through the addition of hearing aid equipment. Serious consideration is now being given to types of programs that utilize residual hearing to the greatest possible extent.

9. Vocational Training, Vocational Guidance and Adjustment, and Follow-up

The shop program is sometimes regarded by the administrators of the school as vocational and at other times as prevocational. The Committee found, however, that the activities offered were purely prevocational

SUMMARY OF FINDINGS AND CONCLUSIONS

in nature and did not adequately prepare the graduates for employment.

The majority of the pupils upon graduation have been referred to academic and vocational high schools for the normally hearing and in the majority of cases these graduates have experienced failure after a short time in these schools. There seems to be a general lack of understanding particularly on the part of some of the vocational instructors of the girls as to what were the more important needs of the graduates and where those needs could be most satisfactorily met. Advantage has not been taken of the facilities offered for the vocational training of deaf boys and girls at the two state supervised resident schools for the deaf, namely the New York School for the Deaf in White Plains and the Lexington School for the Deaf at 68th Street and Lexington Avenue. In a follow-up survey made by the Committee of the graduates of P.S. 47 for the past ten years conditions of maladjustment in employment were found among these graduates similar to conditions that are found in connection with the study of all young people whether they are acoustically handicapped or normally hearing, who because of personality difficulties did not adjust to the job. This, in the opinion of the Committee, reflects a need for a better program of guidance and counselling which will lead to better vocational adjustment.

The need for guidance for deaf pupils today is great. The evidence of maladjustment has been presented repeatedly by guidance and employment experts and much of it as far as the deaf are concerned occurs in relation to employment. Personality difficulties, dissatisfaction with the job or with conditions surrounding the job, and absence of a good general perspective on life are more frequent causes of loss of jobs than is adequate training or lack of specific skill.

SUMMARY OF FINDINGS AND CONCLUSIONS

10. Mentally Retarded Pupils

A number of mentally retarded acoustically handicapped pupils were found in a special ungraded class at P.S. 47. Several of these pupils evidenced serious behavior disorders and were acute problems. Their mental behavior defects were primary factors and were of more importance than their loss of hearing.

11. Psychological Testing of Pupils in Grades V to VIII at P.S. 47

Pintner non-language tests administered to 140 pupils indicated that the average intelligence level of the school is considerably higher than that of the average pupil in residential schools for the deaf.

The New Stanford Achievement Tests administered to the same pupils indicated that the general achievement level of the school was also higher than the average for resident schools for the deaf.

Pupil portrayal and personality tests given to 110 pupils indicated that there were apparently many mal-adjusted pupils in the schools.

V. *Services Available in addition to those offered by P. S. 47*

In addition to the program offered by the Board of Education at P.S. 47, the city day school for the deaf, the only additional free services found by the Committee for acoustically handicapped children are some lip-reading classes conducted under the auspices of the WPA and some remedial classes conducted at the N. Y. League for the Hard of Hearing and the academic and vocational programs offered by the state supervised resident schools for the deaf.

VI. *Implications of Psychological and Speech Tests Administered to Selected Groups of Normally Hearing and Acoustically Handicapped Children*

Speech tests administered to 411 acoustically handicapped pupils attending the public school classes for the normally hear-

SUMMARY OF FINDINGS AND CONCLUSIONS

ing revealed that no significant speech deviations from the normal were noted for children whose average hearing loss in the speech range was 30 db. or less, but that speech deviations became proportionately more pronounced with the increase of hearing losses above the level.

The results of psychological tests administered to 287 acoustically handicapped pupils, who were attending the public school classes for the normally hearing, were compared with the results obtained from tests administered to 282 normally hearing children. This comparison revealed that acoustically handicapped pupils attending public schools for the normally hearing, who have average losses in the speech hearing range of not over 20 db., have no serious educational problems as far as achievement is concerned, but that as the average hearing losses increase beyond this 20 db. point, the educational difficulties and corresponding retardation increase.

B. Conclusions

On the basis of its studies the Committee has reached the following conclusions:

1. That approximately 4%, or more than 30,000 of the children now attending New York City elementary and secondary public schools have a hearing loss of at least 9 decibels in one or both ears.
2. That 63%, or approximately 20,000 of these 30,000, do not have over a 20 decibel loss in the better ear for speech hearing and therefore need no special compensatory educational program beyond favorable classroom seating.
3. That of the balance, about 24%, or approximately 7,500, have between 20 and 40 decibels loss in the better ear, and about 11%, or approximately 3,300 have between 40 and 60 decibels loss in the better ear, and that many of the former and most of the latter group will need some compensatory educational provisions for successful

SUMMARY OF FINDINGS AND CONCLUSIONS

continuance in or close to the program for the more normally hearing.

4. That all of these 30,000 children need periodical otological examinations and that all may be actually or potentially in need of medical supervision or treatment.
5. That the yearly 4A group audiometer screen testing of all public school children followed by the pitch-range audiometric testing of all cases with 9 decibels loss or more if coupled with a program of systematic otolaryngological examination and medical care for these children would prevent the progression of many of these cases from the status of a slight handicap to one of serious proportions.
6. That the city already owns sufficient group testing equipment to make such a yearly screen testing program possible but that additional pitch range audiometers are needed.
7. That provision must be made for the inauguration of otological, medical testing and educational programs for acoustically handicapped children.
8. That the Board of Education offers practically no compensatory educational program for the acoustically handicapped children now attending the classes for the normally hearing. The only program available is that given at P.S. 47, the day school for the deaf, in which enrollment is limited to 500 pupils.
9. That in connection with the program given at P.S. 47; the committee is of the opinion:
 - (a.) That many of the pupils now in attendance at that school could succeed in classes for the normally hearing if a compensatory educational program such as lip-reading instruction, or proper hearing aids, were provided.
 - (b.) That due to lack of programs in outlying Boroughs many of the pupils must travel excessive distances by bus to reach P.S. 47, which is located in the Borough of Manhattan.

SUMMARY OF FINDINGS AND CONCLUSIONS

- (c.) That additional supervising assistance is needed at the school.
 - (d.) That a considerable number of teachers on the staff have not had adequate training in the special techniques of this field.
 - (e.) That the teacher training program as now offered is superficial and ineffective.
 - (f.) That the requirements for licensing of special teachers of the acoustically handicapped do not insure the selection of adequately trained teachers.
 - (g.) That the academic curriculum is in need of extensive revision.
 - (h.) That the pre-vocational training program is in need of extension and improvement.
 - (i.) That more consideration should be given to vocational needs of the pupils as they approach time for graduation, and that more effective care should be given to these pupils in directing them to secondary programs beyond P.S. 47.
 - (j.) That an active follow-up program for the graduates is needed.
10. That there should be formulated a comprehensive compensatory educational program to meet the special education needs of these acoustically handicapped children.
11. That this comprehensive program should aim to keep the acoustically handicapped child in or as close to the regular program for the normally hearing child as is possible without endangering his educational, social and emotional growth and progress. The greater an individual's handicap the greater becomes the required compensatory program and thus the farther from the normal program the child is removed. The Committee recognizes that it will not be possible to meet the compensatory educational needs of all acoustically handicapped children and still permit them to remain for the major

SUMMARY OF FINDINGS AND CONCLUSIONS

part of their day in their regular classes for the normally hearing. It may be necessary to segregate more or less permanently some of them in special groups. If this becomes necessary the Committee believes that the needs of these pupils who must be so segregated can best be met in either special day schools for the acoustically handicapped with enrollment capacities of not less than 150 pupils, or in state supervised resident schools for deaf. The special programs of this type and of this size provide for suitable grading and adequate supervision by qualified supervising teachers.

The Committee believes that a complete and comprehensive compensatory educational program for the acoustically handicapped would include provision for the following depending upon the needs of the individual pupil:

- (a.) A favorable seat in the regular class.
A favorable seat means a seat as near the teacher as possible for maximum use of hearing and an unobstructed view of the teacher's face for lip-reading.
- (b.) A favorable seat in the regular class and lip-reading instruction.
- (c.) A favorable seat in the regular class, a hearing aid and lip-reading instruction.
- (d.) A favorable seat in the regular class, lip-reading instruction, a hearing aid, and special tutorial service.
- (e.) Partial attendance in the regular class for certain subjects and partial attendance in a special class for the acoustically handicapped in the regular school for normally hearing children.
- (f.) Full attendance in a special class for acoustically handicapped children in a regular school for normally hearing children.
- (g.) Full attendance at a special day school for acoustically handicapped children.

SUMMARY OF FINDINGS AND CONCLUSIONS

- (h.) Full attendance at a residential school for acoustically handicapped children.

A careful case-study of the needs of each child and not the degree of hearing loss alone should be the basis for the selection for any given program. This case study should include the medical and educational findings and also results of consultations with the parents. The following factors should be carefully considered in arriving at the decision:

1. The type of ear disease involved

A child whose prognosis is poor and who faces a progressive loss of hearing should be given lip-reading instruction as early as possible, even though his hearing loss might be so slight as to indicate no immediate need for this.

2. The degree and extent of the loss in the speech hearing area (Tones 256 to 4096)

Although it is not possible to determine a special program exclusively on the basis of degree of hearing loss, in a general way, it is probable that children who have as little loss as 20 db. or less in the better ear will not need any special help beyond a favorable classroom seat in a regular class for normally hearing children. This may also be true in many cases with hearing losses as high as 30 db. in the better ear, although lip-reading instruction is indicated for most pupils having over a 20 decibels loss in the better ear. In general, also, those cases having losses of 50 to 60 decibels in the better ear might need any one or even all of the provisions of program (d) above, in order to guarantee their successful continuance in the regular classroom. Under certain circumstances, particularly in the case of pupils with losses that approach the 60 decibel end of this scale, the need is apparent for any one of programs (e), (f), (g) or (h). Those cases having losses of more than 60 db. are potential candidates for one or another of

SUMMARY OF FINDINGS AND CONCLUSIONS

programs (e), (f), (g) and (h). Other factors in addition to the loss of hearing will determine which program should be provided.

3. The age at which the hearing loss occurred

Children who lose their hearing after the age of 5 and thus have established and are able to retain some speech will have a much better chance to succeed in a program close to normal than will those who were born with the hearing loss or acquired the loss early in life. Thus a child born with an average speech hearing range loss of 50 decibels is a greater educational problem than a child who acquired a similar average loss at the age of 8.

4. The native intelligence of the child

The level of general intelligence is an important factor in the success or failure of any child in any given program.

5. The degree of success or failure the child is experiencing

If a child is progressing satisfactorily under an approximately normal program it is not desirable to remove him far from that program merely because he has a severe hearing loss.

6. His psychological make-up

A maladjusted and emotionally unstable acoustically handicapped child will have greater difficulty succeeding in a normal program than one who is well adjusted, and may need the benefit of the reduced tempo and individualized instruction of a special program such as is offered under (e), (f), (g) and (h) above.

7. The economic and social background of the family

The social background of the pupil may be such that tutoring cannot be provided at home. The economic status of the family may show the need for vocational training for job placement at an early age. These needs may indicate the necessity of the programs offered under (g) and (h), particularly the latter.

SUMMARY OF FINDINGS AND CONCLUSIONS

8. The special programs available in any community

If a special school program is required and the pupil lives a great distance from a central day school for the acoustically handicapped the desirability of attendance at a residential school may be indicated. Similarly the absence of any special program short of program (g), in the immediate vicinity may necessitate either programs (g) or (h).

The foregoing illustrate the necessity for a case study of each child to determine particular needs and the most suitable facilities available for meeting them. The lack of extensive special facilities may not make it possible to provide the program that would be most desirable and it may therefore be necessary to move the child farther away from the normal program than would otherwise be necessary. However, it is extremely important that no acoustically handicapped child be permitted to languish indefinitely under so called "normal" conditions or under an inadequate special educational program wherein he is inevitably experiencing educational and emotional maladjustment because of his deafness.

Recommendations

CHILDREN WITH impaired hearing represent a group which includes some children who will require special educational consideration. Some will require temporary, others prolonged compensatory school programs. An adequate program for these children must include:

1. A general testing program to find children with impaired hearing.
2. An examination of children with impaired hearing to select those children who require either medical care, special educational provisions or both.
3. A program for follow-up in order to insure the provision of adequate medical care.
4. The provision of a compensatory educational program as necessitated by the individual's handicap.

The Committee therefore recommends:

1. *That there be appointed an assistant director in the Department of Education in charge of the education of the acoustically handicapped, academically qualified and experienced in this field.*
2. *That this Assistant Director be responsible for:*
 - (a.) *The planning of a comprehensive and continuous testing program to discover children with impaired hearing.*
 - (b.) *The development of suitable compensatory educational facilities for the education of the acoustically handicapped.*
 - (c.) *The administration and supervision of special educational program and other compensatory services established.*

RECOMMENDATIONS

3. That the Assistant Director be provided with adequate supervisory assistants and that such personnel be determined by the needs of the program demands.

4. That the hearing testing program be conducted with the assistance of the teachers in the individual schools.

5. That the hearing testing program include a screening testing of all school children and that a pitch range test be given all those found to have a hearing loss of nine decibels or more. That children with nine decibels or greater hearing losses be referred for pitch range audiometer testing and otolaryngological examinations.

6. That the principal of each school be required to report to the Assistant Director the names of those children discovered to have an obvious hearing loss apparently causing or apt to cause educational difficulties.

7. That there be maintained a permanent record of hearing tests and otological examinations of the child's school health record and that there be maintained in the office of the Assistant Director suitable continuous records of hearing tests and otological examinations for all children assigned to compensatory educational service.

8. That all children found to have hearing losses which require compensatory educational measures be reported to the Assistant Director in Charge of the Education of the Acoustically Handicapped Children together with a complete diagnosis and recommendations.

9. That the physician in charge of a child found to be in need of further examination and of treatment be requested to report the fact to the school physician for follow up. That the school physician be responsible for the follow-up of all cases found to be in need of treatment who are not under treatment by private physicians.

10. That there be established in addition to P. S. 47, The Elementary School for the Deaf, educational units for children

RECOMMENDATIONS

with severe hearing losses in selected geographical areas of the city. That such units be established only where there is a minimum of 100 children whose acoustic handicaps are of such severity that they cannot be adjusted in regular school classes, but who can be brought together in a single building for special education.

11. That those units provide suitable educational facilities for kindergarten and the first elementary years and that the grade span in such classes does not include multigrade instruction beyond 2 full consecutive years.

12. That P. S. 47 be continued as a school for the deaf.

(a.) That it serve as the unit for its geographical area for children who require a special educational program in segregated classes.

(b.) That it serve as a junior high school for its geographical area for the continuation of the education of children who cannot be adjusted in regular classes.

(c.) That it serve as an academic and vocational high school for children from all boroughs who cannot be adjusted in academic high and vocational high schools.

13. That as children now attending P. S. 47 who have sufficient residual speech hearing to enable them to adjust to a regular or compensatory program are returned to the regular schools, and as children who are now traveling excessive distances to P. S. 47 are assigned to the new educational units for the deaf, as recommended, the vocational facilities in P. S. 47 be expanded for vocational training of those acoustically handicapped children who cannot be adjusted in existing vocational schools.

14. That until such time as better arrangements are perfected at P. S. 47 and in the vocational schools to care for the acoustically handicapped, those children with severe hearing

RECOMMENDATIONS

losses be referred for vocational training in the State supervised residence schools for the deaf which provide adequate vocational training programs.

15. That the prevocational training offered at P. S. 47 be extended to include a broader program of industrial arts, and that the nature of this training be exploratory in as many fields as possible and designed to give pupils a general knowledge of tools, materials and processes and also to instill good working habits and arouse an early vocational interest. The periods provided for the pupils in this work should be not less than 90 minutes in length, and the pupils in the 7th, 8th and 9th grades should be given from three to five such periods a week.

16. That a more active follow-up program be maintained by P. S. 47 with its graduates to determine their degree of success or failure and a better understanding of the problems they meet after they leave the school.

17. That more consideration be given at P. S. 47, and in any units that may be established, to the use of group hearing aids in class instruction in subject matter as well as for the purpose of developing the use of residual hearing to the fullest extent for language growth and speech improvement.

18. That the pupils in P. S. 47 who because of considerable residual hearing or other factors can adjust satisfactorily in the classes for the normally hearing with the provision of some form of compensatory education be returned to regular classes.

19. That there be added to the present staff of P. S. 47 two qualified supervising teachers, whose full time shall be devoted to supervisory activities.

20. That the school hours in special classes for the acoustically handicapped correspond with those of the regular schools.

21. That classes for acoustically handicapped pupils up to the age of 10 years be restricted to a maximum of 10 pupils and

RECOMMENDATIONS

that classes for older children be limited to a maximum of 12 pupils.

22. That the practice of semi-annual promotion involving change of teachers be discontinued and that teachers retain the same classes for at least a full academic year.

23. That well diffused artificial illumination be provided so that there may be a minimum of 15 foot candles of illumination in all parts of class rooms and that adequate means for controlling natural light be provided.

24. That provision be made for the training of segregated acoustically handicapped pupils for the purpose of transferring them to regular classes when they have acquired sufficient special skills.

25. That the academic curriculum of P. S. 47 be revised to meet the individual needs of acoustically handicapped children and:

- (a.) that more liberal use be made of modern teaching mediums based upon pupils' interests.*
- (b.) that more speech, silent-reading and lip-reading activities be given below the 2-B level and that there be a corresponding reduction on this level in the requirements for written work.*
- (c.) that there be a reduction of formal drill activities in language teaching and a corresponding increase in the utilization of natural language approaches.*
- (d.) that teachers be released from close adherence to standard syllabi used in the normally hearing classes of the elementary schools.*
- (e.) that a program of acoustic training activities be developed based upon the hearing ability of individual children which will lead to the maximum utilization of their residual hearing.*
- (f.) that the formulation of a program for the utilization of residual hearing be under the direction of one of*

RECOMMENDATIONS

the recommended supervising teachers who should be highly qualified, trained and experienced in the general and specific problems of teaching the acoustically handicapped, and who in addition has a thorough knowledge of speech correction problems and of the use of hearing aid equipment.

- (g.) that more use be made of the tactile sense and eurythmic activities in the development of speech.*
- (h.) that a planned physical education program be carried out under the direction of a specially trained teacher in this field.*

26. That acoustically handicapped children who are mentally defective be cared for on that basis.

27. That only children below the age of ten years and who reside at excessive distances from P. S. 47 or from any of the proposed additional units for acoustically handicapped children to be established, be provided with transportation to and from school. If it is necessary to transport children it should be provided whenever possible by public carriers.

28. That the requirements for licensing of teachers for the acoustically handicapped established by the Board of Education be revised to require that the six hours of practice teaching and observation specified must be secured directly in the field of the education of the acoustically handicapped and that no substitutions for this requirement, either through practicum with the normally hearing or through years of teaching experience with the normally hearing, be permitted.

29. That the teacher training program be discontinued at P. S. 47 until such time as it can be reorganized on a professional basis and conducted by qualified supervising teachers, and that those teachers under regular appointment to the school, who have not had adequate training, be given leave of absence to acquire this training.

30. That the teachers in P. S. 47 be given an opportunity to

RECOMMENDATIONS

visit schools with outstanding programs for the education of the acoustically handicapped and be encouraged to attend and participate in conventions and meetings of the teachers of the acoustically handicapped.

31. *That an examination be scheduled to fill the teaching vacancies that now exist at P. S. 47 and that these examinations be given during holiday periods to enable qualified teachers from other parts of the country and qualified graduates of long established training centers to take them.*

32. *That in addition to P. S. 47 and the additional units recommended, there be provided in selected schools compensatory services for lip reading and speech correction for acoustically handicapped children who can be adjusted to the regular school program with such assistance.*

33. *That these compensatory services be so distributed geographically that they will be available within reasonable travel distance for all children who require them.*

34. *That recommendations for lip reading be based primarily on otological findings and supported by educational, social and economic factors involved. Adequately trained teachers should be assigned to this work and given a status equal to teachers of other classes.*

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